pulse beat

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Publisher Manitoba Pulse & Soybean Growers

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Manitoba Pulse & Soybean Growers thanks the authors who have taken the time to contribute to this publication.

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Please direct your comments or concerns to Sandy Robinson at 204.745.6488 or email sandy@manitobapulse.ca

IN THIS ISSUE

Cover photo courtesy of Dennis Lange, Manitoba Agriculture

SMART DAY

SOYBEAN MANAGEMENT & RESEARCH TRANSFER

An all-day educational event for farmers and agronomists to sharpen their soybean management skills!

Manitoba Pulse & Soybean Growers has a major investment in agronomic research projects, many of which are conducted at the CMCDC research farm. Attendees will tour research plots, learn how results can be applied to their farm and interact with researchers and extension specialists.

RESEARCH PROJECTS AND PRODUCTION QUESTIONS WILL INCLUDE:

- Ultimate Soybean Challenge – *What input packages will maximize yield and profitability?*
- Preventing and Managing Soil Compaction – *Are tracks better than tires?*
- Refining Soybean Insurance Coverage – *What research is being done to update crop insurance for soybeans?*
- Minimizing Soybean Harvest Losses – *Do air reels, ground speed or cutting angle make a difference?*
- Soybean's Critical Weed Free Period – *How long do I need to maintain weed-free conditions during plant establishment?*

Wednesday, July 19, 2017

8:30 am – 3:00 pm

REGISTRATION 8:30 am | LUNCH PROVIDED

Canada-Manitoba Crop Diversification Centre

Portage la Prairie, MB – 370 River Rd. 1/2 km north of Hwy 1

PRE-REGISTRATION IS REQUIRED FOR ALL ATTENDEES

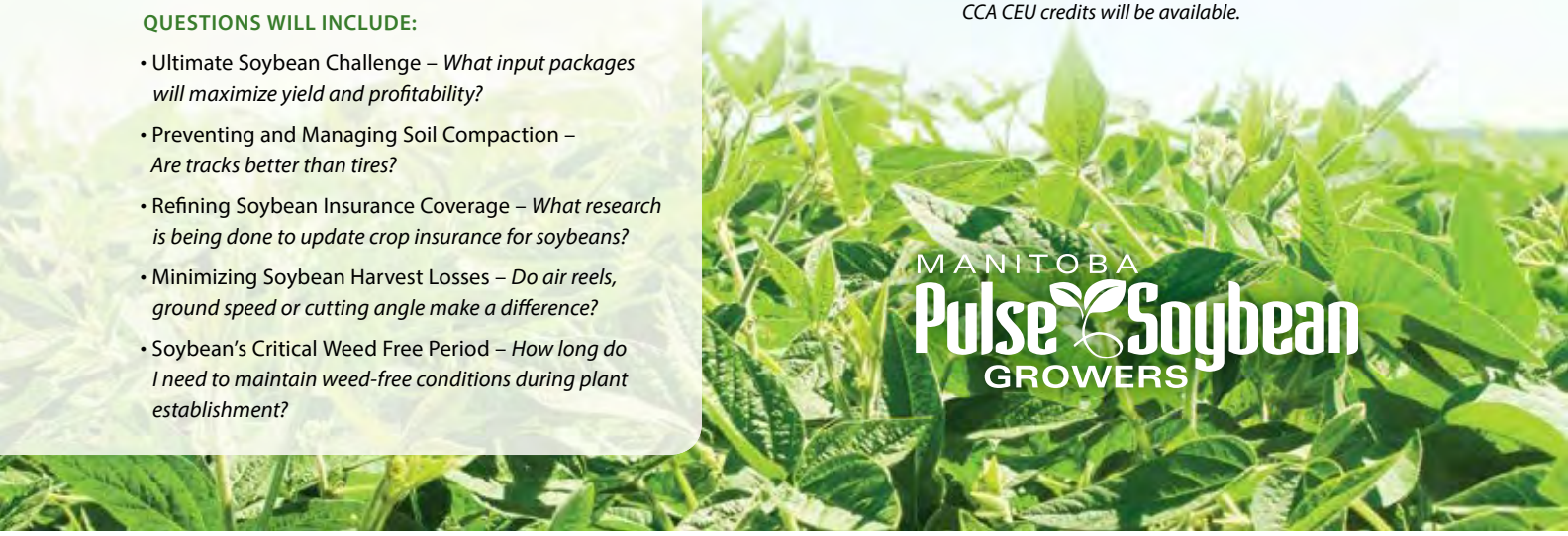
Register online – manitobapulse.ca

or contact Laura Schmidt at 204.751.0538

Registration is free for farmer members in good standing with MPSG.

Agronomist/non-member fee is $50.

CCA CEU credits will be available.



2017 MPSG COMMITTEES AND REPRESENTATIVES

MPSG COMMITTEES – *The first named is chair*

Executive – J. Voth, J. Preun, E. Sirski, F. Labelle

Governance/HR – F. Prince, E. Sirski, F. Labelle

Finance – J. Preun, M. Rattai, F. Labelle, S. Robinson

Resolutions – C. Penner, M. Rattai, B. MacMillan

Nominations – C. Penner, M. Rattai, B. MacMillan

Communications/Member Relations/Market Development – E. Sirski, R. Vaags, C. Penner, B. MacMillan, F. Labelle, T. Dyck, L. Stevenson, S. Robinson

Research – F. Prince, B. Martens, A. Turski, J. Preun, C. Penner, F. Labelle, L. Stevenson, G. Bartley, C. Tkachuk, W. Voogt, industry advisors

MPSG REPRESENTATIVES

Canadian Grain Commission Pulse Sub-Committee – F. Labelle

Grain Growers of Canada – B. Martens

Keystone Agricultural Producers – R. Vaags, C. Penner, F. Labelle

- **General Council** – F. Labelle
- **Pulse/Oilseed Sub-Committee** – F. Labelle
- **Commodity Group** – R. Vaags, C. Penner
- **Safety Group** – F. Labelle

MCVET – L. Stevenson, D. Lange

PGDC/PRCPSC – B. Martens, L. Stevenson, D. Lange

Pulse Canada – R. Vaags, B. Martens (alt), F. Prince (alt)

- **Sustainability** – F. Prince

Soy Canada – E. Sirski

Western Canadian Pulse Growers Association

- **WGRF** – Corey Loessin (SPG)
- **CGC Western Grain Standards Committee** – E. Sirski (exp. 2018) *This is a four-year term that rotates between APG, SPG and MPSG.*

Message from Board Chair

Jason Voth, Chair

SPRING HAS ARRIVED and the 2017 crop year has begun. Once again, we as farmers are doing what we do best: growing safe, sustainable and profitable crops to feed the world. Our methods evolve and change year after year, as new technologies, new research and new practices are made available and implemented. Now, how do we get the non-farmers in Manitoba, Canada, or the world to get on board with what we do and understand that we are not out there trying to hurt them or the environment?

A carbon tax is being forced on the province by Prime Minister Justin Trudeau. Manitoba Pulse & Soybean Growers (MPSG) has considered taking a stand against this. This, we are learning, is very tricky to do. We don't have many facts from the province on how this tax may look. And, as such, we don't know how it will affect Manitoba's farmers.

Information on what exactly will be taxed, what will be exempt, and where that money will be spent is not available. We're left to form opinions based on hearsay and assumptions, both of which are not solid foundations for policy development.

A couple things we can all agree on are that farmers are price takers. We have no way of passing on a tax to someone else. We can also agree that a $50/MT carbon tax will add up when you account for all the other foreseen and unforeseen on-farm expenses. Fuel, fertilizer, equipment, freight, services and seed – anything that we buy or consume – will eat away at our profit margins, which, in recent years have been good, but not something we can bank on. When those margins shrink, this tax may become an unbearable burden. Some fear that there won't be anything left for profit.

We as farmers need to use this time to educate ourselves on this issue. Get informed, so that you can form a good, sound stance for or against this looming carbon tax. Let's leave our hats at the door. Let's leave emotion out of this.

Once your decision is clear, then make sure that it is heard. Speak to your local MLA. Write a letter to the Premier. Let's tackle this with cool heads, voicing our positions when appropriate and listening to the positions of others when at the bargaining table. It's time we stand up for ourselves.

MERGER

A multi-commodity group merger is another topic that is making headlines these days. I have been an advocate for this for the last two years. When you look at all the positives, it is actually very hard to find anything negative. Five groups in Manitoba have signed a memorandum of understanding (one-year commitment) to work together to develop a plan to merge. Decisions over the course of the next year will be made as a group between the like-minded associations involved, and will include consultation with each organization's membership.

The hope is to save on some overlapping administration costs, as well as deliver a more efficient research program, more diverse market development initiatives and more effective policy and advocacy back to our members, the farmers of Manitoba. We want to be as transparent as possible in this journey and I hope we will receive some feedback from all of you. If you think it's a good idea or bad idea we want to know.

RESEARCH

I would also like to highlight the research we are conducting for our farmers. This has been the major focus of MPSG for many years now. Approximately 60% of our annual budget is put into research and extension to make your farms more profitable. Our research is independent, meaning we are not taking direction or money from seed companies, chemical companies, or anyone else trying to sell you something.

As an indicator that our research is having an effect, our staff is questioned by many in the for-profit industry over results that are contrary to their own. Our results are sound. MPSG follows very strict protocols to make certain the results stand on their own. You can find all our results on our website. We have conducted numerous studies that will impact your bottom line in a good way. Make sure to have a look and make sure to tell a neighbour.

I encourage you to take time during the summer to attend some MPSG events. Have a great season!

– Jason ■

Soybean Scout

What are the causes of chlorotic and necrotic spotting on each of these soybean leaves??

A

B

Answers can be found on page 43

Message from Executive Director

François Labelle, Executive Director

AS THE WORLD TURNS

The seasons keep rolling by, weather throws its curveballs at us and production challenges hit us from all sides, but we are used to that. As farmers, you continue to grow crops as best you can while taking care of the environment, your soils, your equipment.

Change is the constant, we say, but even with change some challenges keep coming back. It can, at times, feel like we're repeating ourselves – like we're playing a broken record. Farmers and grower organizations are well prepared to handle these conditions, facing both old and new challenges as they come up. And, amid all of this, we stay positive. The future looks bright.

SOY CANADA

Soy Canada is forecasting 6,000,000 acres of soybeans in western Canada by 2027. Stats Canada's seeding intentions report indicated growers in western Canada intend to seed more than 3,100,000 acres in 2017, which is a huge move towards the 6M-acre forecast. I suspect we will see 6M acres of soybeans before 2027. The biggest unknown will be the weather.

With 2.2M acres forecasted in Manitoba for 2017, we are starting to wonder about where this trajectory could lead. How many acres is a sustainable number for Manitoba – 2.5M, 3M, more? Ontario has just over 8M acres of arable land and they are growing about 3.2M acres of soybeans per year. If this were to hold true with similar rotations in Manitoba, we could see substantially more acres in the future.

Along with increased acres, Soy Canada is forecasting an increase in processing capacity in Canada, in particular, the west. This fits in well with MPSG's goal of seeing a soy processing facility built in the province. We started this discussion in 2013 with an initial feasibility study to get the conversation going. The study, along with the increased acres, has the industry talking. Recently, I have spoken with a number of senior people in the crushing industry. They all said they are looking at it and it's just a matter of time.

What is needed to make it happen? A modest increase in acres sustained over several years. The trend line is there. MPSG will continue the conversation on getting a processing plant built at the best possible location in Manitoba.

TRANSPORTATION

This file has stalled out. There was some confidence in the whole industry and government that we were going to see some legislative changes early this spring, but those deadlines have come and gone. Why?

I hope the stall is not a result of groups lobbying in opposition to some of the positive changes we were expecting. It is possible that the whole discussion on trade is consuming all the resources in Ottawa, pushing transportation policy to the back burner.

Going forward, we all need to make certain that pressure is kept on this conversation. Talk to your politicians and talk to your industry associations to keep this moving and make certain the file does not get dropped totally. We are only a little over two years away from the next federal election and this cannot be left waiting. If we let this fizzle out, we'll have to start this conversation all over again.

TRADE – NAFTA – MARKET ACCESS

We could spend all the free time and resources our association has on trade and have minimal impact on policy. This is why we continue to partner with national organizations such as Pulse Canada and Soy Canada.

The recent fumigation issue in India is an excellent example of how these partnerships work. Pulse Canada has been working with the federal government for years on this issue, so they could quickly get people engaged in the discussion. It did not take long and a mission of government and Pulse Canada people went to India to directly deal with the issue. Our pulse acres are small in comparison to our sister organizations, but by working in partnership we can reap the benefits of open markets.

Though we are not active day-to-day on trade issues, we do monitor many areas and do our best to keep growers informed.

Looking at market access and MRLs: we work with Pulse Canada and our sister associations to distribute an advisory that informs farmers if there are pesticide issues they need to be aware of. We are part of national committees that develop these advisories. Our industry and our crops could be harmed if some key markets were suddenly closed to us. And we do not want a triffid-type incident to ever happen again if we can help it.

It is important that you read the advisory and pay close attention to labels on products, so you or your custom applicators do not apply product at the wrong rate, wrong time or the wrong product for the market for which your commodity is destined.

RESEARCH AND PRODUCTION

This is the area in which your association invests most of its time and most

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NOTICE TO MEMBERS

In accordance with MPSG bylaws, any active member who wishes to bring forward a resolution to the annual general meeting (AGM) must provide notice to the board of directors by December 1 of the year prior to the AGM.

Resolutions to be presented at the 2017 AGM must be received by December 1, 2017.

Please forward to Sandy Robinson at ***sandy@manitobapulse.ca*** on or before that date.

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of your check-off dollars. We do this to help you grow good crops in an economical and sustainable way for the long term. Check out our website to look at the research that has been done, and the research that is ongoing. There is lots of valuable information there.

We are including some of our production resources with this edition. These are valuable resources that other provinces have asked for on behalf of their growers. I hope you use them and share them with others if need be. We have more, if you run out. Contact our office and we'll make sure some get sent your way.

Our production staff is available to assist you with your production issues and problems. We are always looking for producers to participate in on-farm trials or to add to our scouting network, so please give them a call.

On the research side, staff has been working very hard reviewing long proposals for the Next Policy Framework. This will be setting some of our research funding for the next five years. It's very important we do our due diligence on this.

STAFF

It seems almost every *Pulse Beat* for the last few years has had some staffing announcements, either new positions, summer or term positions or replacing people who have left. That seems to be normal in today's environment, so we need to get used to this.

I cannot say enough how proud the board and I are of MPSG staff. They work hard to attain the best results in research, or have the best articles, best field days and/or presentations. They are very hard on themselves to deliver high quality all the time. They believe they can and will make a difference and that is very important.

At times, some MPSG staff members have been questioned by people, companies or even their personal friends who may not agree with their results or messages, as they may be contrary to their own positions or the positions of the companies they work for. We need to support them to continue doing the best job possible and to be confident that their unbiased results are, indeed, correct and worth defending.

MERGING DISCUSSION

On May 1, the chairs and presidents of five boards (Manitoba Pulse & Soybean Growers, Manitoba Corn Growers, Manitoba Flax Growers, National Sunflower Association of Canada and Manitoba Wheat and Barley Growers) signed a Memorandum of Understanding to work towards merging. This process will bring out a plan and answer some concerns expressed by the board and some farmers. Please let people know what you think, and, as someone said to me, "I hope we hear not only the negative comments but also the positive ones."

It's a long season ahead. Please work safe, and I wish you all the best.

– François ■

Strategic Plan Update

ON MARCH 21, Manitoba Pulse & Soybean Growers (MPSG) staff and board took part in a strategic planning session facilitated by Rob Hannam and Michael Black of the Synthesis Agri-Food Network.

As part of MPSG's continued commitment to serve its membership, a sizeable portion of the discussion focused on how the association can better meet the current and future needs of its farmers and better communicate value to him or her.

Based on a survey Synthesis asked the group to fill out prior to the meeting, MPSG board and staff were guided through a series of exercises and scenarios related to its mission, vision, future and day-to-day operations of the association. By the end of the day, a road map was drawn, some goals were tweaked/added and a new vision and mission statement were conceived and implemented.

The resulting strategic plan report showed MPSG committing to five key focus areas: research programs; research communications; market development and policy; communications and member relations; and operations and governance.

Due to the rapid growth of the pulse and soybean industry in Manitoba, MPSG has also committed to revisiting its strategic plan on a regular basis, ensuring that its mandates and focus areas are still doing the utmost to ensure your farms are as profitable and sustainable as possible. ■

MPSG Welcomes New Staff

Increasing our capacity to share research results, host extensions events and conduct on-farm research means more Research and Production staff for MPSG. The new Extension Coordinator position strengthens MPSG's ability to fulfill our mission to provide production support for our farmer members. The new On-Farm Technician will help MPSG make the On-Farm Network accessible for farmers right across the province.

LAURA SCHMIDT

Extension Coordinator

Manitoba Pulse & Soybean Growers (MPSG) welcomes **Laura Schmidt** into the new role of Extension Coordinator. Laura will manage activities like the *SMART* field day and *Getting it Right* soybean production meeting, as well as co-edit *Pulse Beat* magazine. Laura offers a unique expertise in dry bean agronomy and plant ecology she earned through her studies at the University of Manitoba. She is completing her Masters' degree working on an MSPG-funded project, *Optimizing plant spatial arrangement and weed management for dry bean production*, under the supervision of Dr. Rob Gulden. Check out her project results on page 39.

"I'm looking forward to being able to continue communicating research and production knowledge to benefit farmers," said Laura. "I'm excited for the opportunity to creatively apply my knowledge and skills to this position and continue to bring valuable extension resources and events to our farmers."

Dates to Remember

Crop Diagnostic School
Carman, MB
July 4–6 | July 11–13

SMART Day
Portage la Prairie, MB
Wednesday, July 19

Great Tastes of Manitoba
Saturday, December 2
6:30 pm – CTV Winnipeg

Growing up in the farming community of Altona provided inspiration and direction during the course of her undergraduate studies. Her interest in science focused on biology, with a specialization in ecology and statistics, making her a perfect candidate to study resource capture and population dynamics in dry beans. Her experience as a teaching assistant and participation in MPSG's extension events means she has refined her skills in communicating research through practical demonstration.

"Having Laura participate in our events means she has the context for how and why we conduct tech transfer," said Laryssa Stevenson, Director of Research and Production. "She also brings a fresh perspective, so we're looking forward to implementing new ideas."

BRENT WIEBE

On-Farm Technician

The On-Farm Network trials have been concentrated in the eastern half of the province. In 2017, MPSG will continue to expand the network into the central, western and parkland regions of Manitoba. To make these trials more accessible in these regions, MPSG hired **Brent Wiebe** as the new On-Farm Technician. Brent will assist On-Farm Specialist, Greg Bartley, with implementing pea, dry bean and soybean on-farm trials.

As the Network expands, we need to streamline data collection methods and data analysis to ensure accurate results can be efficiently translated into production recommendations. Brent will be key in implementing these improvements. Brent recently graduated from the University of Manitoba with a Bachelor in the Agribusiness program.

Brent's family farms near Altona and grows wheat, canola, peas, dry beans, soybeans and corn. That's what piqued his interest in this opportunity to help farmers make profitable decisions on their own farm by conducting their own research.

"Brent has a tremendous work ethic and determination to learn, which is instrumental in conducting these trials," said Greg Bartley. "He has experience working alongside farmers and understands the value of their time."

JAKE AYRE

Agronomy Engagement Intern

Due to the success of the Agronomy Engagement Program in 2016, MPSG is continuing to offer the program to ag retails in 2017. **Jake Ayre**, MPSG Agronomy Engagement Intern, will be travelling across Manitoba this summer to connect with and inform farmers and agronomists about MPSG activities and resources related to research and production of soybean and pulse crops.

Jake operates an ag retail with his family near Minto and farms wheat, canola, oats, soybeans, peas, faba beans, barley, winter wheat, corn and flax. Jake recently completed his diploma in Agriculture at the University of Manitoba and will return to university this fall to pursue his degree in Agribusiness. Jake also enjoys engaging public audiences, sharing his passion for farming and food production. MPSG welcomes Jake to the team and is pleased to have him represent the organization across the province. ■

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Memorandum of Understanding

Collaboration among commodity groups

A MILESTONE MEMORANDUM of Understanding (MOU) has been signed committing a group of five, like-minded commodity associations to work towards merging into one organization in order to increase efficiencies and maximize profitability and sustainability for Manitoba farmers.

The involved organizations include Manitoba Corn Growers Association (MCGA), Manitoba Pulse & Soybean Growers (MPSG), Manitoba Flax Growers Association (MFGA), National Sunflower Association of Canada (NSAC) and the Manitoba Wheat and Barley Association (MWBGA).

The MOU represents a significant step forward following more than three years of talks surrounding how the above groups could better work together to maximize member value.

"The Board of Directors of the MWBGA and MCGA have taken a lead in showcasing how commodity groups can work together," said Pam de Rocquigny, who was recently hired as general manager of both MWBGA and MCGA. "This MOU signals a more formalized relationship between all the involved commodity groups as we work together to explore new and innovate ways in how our organizations can improve efficiencies and deliver maximum value to our memberships."

The commodity organizations involved are seeking the help of an advisor to help facilitate the process of taking their commitment to merge from infancy to fruition by facilitating the development of a work plan that includes timelines and consultation with members.

The group has no predetermination of what this common commodity organization will eventually look like. The group has expressed, unequivocally, that it will make sure the farmers from each commodity organization represents will have a strong, critical voice in shaping this merger.

"This is the first step in a long process," said Jason Voth, chair of MPSG's Board of Directors. "I am very pleased to hear that these groups are willing to work together. As a farmer, this makes sense. Good farming is about growing more than one crop. I represent one farm that grows multiple crops. This merger makes sense."

These talks began in the spring of 2014, when at the manager/director level the idea of collaboration among groups began gaining momentum. In November of that year, a motion around the board table was passed to begin investing minimal dollars towards pursuing the idea of working together to increase efficiencies. Months later, a collaboration group was formed. Since that time, a group of interested organizations have met on a monthly basis to discuss the possibilities that have led to the exciting milestone of this MOU.

Currently, all of the above commodity groups, with the exception of the Manitoba Flax Growers, operate out of the same building in Carman, Manitoba.

While five grower organizations have signed the MOU, they are willing to allow other, like-minded commodity groups to join the merger talks, provided they have the same level of commitment to delivering value and increasing profitability among their farmer members. Interested organizations will have an opportunity to join this working group in April of 2018 after the first phase of this process has been completed.

FROM THE MOU

"We share a common goal to improve the sustainability and profitability of farms in Manitoba," reads the MOU. "Our intention is to develop a future working relationship that is efficient, effective and advantageous to our members. Our vision is to work for the next year to develop a plan for merging into a common commodity organization consisting of like-minded grower groups. ■

www.manitobapulse.ca

Soy Canada Asia Trade Mission

February 13–25, 2017

Calvin Penner, Director, Manitoba Pulse & Soybean Growers

◀ *The Canadian Embassy in Japan is across the street from the Emperor's Imperial Palace.*

▲ *Small production facility in Jakarta, Indonesia.*

RECENTLY, I HAD the opportunity to go on a Soy Canada Trade Mission to Indonesia and Japan. Soy Canada is a two-year-old association consisting of soy value-chain members from across Canada. Its thirty-eight members consist of plant breeders, seed developers, seed producers and farmers, as well as elevator companies and exporters.

I went as a representative of Manitoba Pulse & Soybean Growers (MPSG). The MPSG director who sits on Soy Canada's board was unable to go.

The trip started in Jakarta, Indonesia. As this was my first trip to Asia, I made good use of Google and Wikipedia, learning quickly that Indonesia is the fourth most populated country on the planet.

Jakarta's population is more than 10,000,000 and swells to about 12,000,000 with commuters during the day. Including the surrounding area, there are an estimated 30,000,000 people living in the area. It is the world's 13th largest city and is growing very rapidly.

During the time we spent in Jakarta, the delegation consisted of four Soy Canada board members and myself with one more board member joining us in Japan. There were also a number of soybean exporters, all from eastern Canada.

In Jakarta, we met with representatives of companies that use soybeans to manufacture food products. The meetings and seminars were organized by the Canadian Embassy's agriculture trade department in Jakarta.

We also toured a silken tofu production facility to learn about the requirements for getting soybeans earmarked for that market. Silken tofu is tofu with eggs in it. They employed 13 people. This was quite typical, as most of the processing plants in Indonesia are smaller in scale.

We also visited a soy milk plant, which was larger and employed 60 people. They used about eight tonnes of soybeans per month. They could produce eight litres of soy milk from a kilogram of soybeans.

For most of the soy milk producers, consistent size of the bean is important, as the soys are soaked in water and each bean needs to reach saturation at the same time. Higher protein is more desirable, as the higher the protein the higher the yield of milk per kilogram of soy.

Indonesia is a very price-sensitive market for GMO soys. This has led to some complaints about quality, but if you buy bargain product you will get low-quality product. Although there is a move for some consumers to request non-GMO soys, Indonesia is, historically, a GMO market.

Importers who want non-GMO soys, typically get them from eastern Canada, as about one-third of their soys are non-GMO.

From Jakarta we went to Sarabaya, which is Indonesia's second largest city with a population of about 1,500,000. One of the things I learned there was that in the hot and humid climate, if soys are not stored in an air-conditioned warehouse, they will discolour in about a month. They are usually stored in a warehouse near the port and then moved to smaller warehouses near the end users.

We visited a co-op that distributed soys to the many small tempeh and other soy product manufacturers. We saw a constant flow of scooters leaving the warehouse carrying a bag or two of soybeans draped over their back seats. Some soys also went out by small trucks. We then toured a tempeh production plant. Tempeh is produced by soaking, heating, splitting, and removing the hulls of soybeans. They are then mixed with a yeast and left to ferment for two days. After this, they are then either left to ferment longer in small bags or pressed and fermented longer in banana leaves. This small plant producer made enough tempeh for its own village.

Indonesia has inexpensive labour, so they have many small-volume soybean processors.

JAPAN IS A very different type of soybean market. They will only use non-GMO soys for food production. But there is a crusher market for GMO soybeans for oil and meal.

Japan seemed to have a very different, formal culture. They take the cultivation of long-term relationships very seriously. They like to have an ongoing relationship with anyone they are doing business with. There is also a very strong "Buy Japan" movement.

Some of the other trends I observed in Japan are smaller families, more people living alone, and an aging, declining population. The cost of living

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is also rising in Japan. This also means that more women are working outside of the home, which has an effect on food consumption.

We met with some of the various soy user associations to see what their needs are.

We met with the natto producer associations at the Canadian Embassy in Tokyo. Natto is usually a smaller soybean that is soaked and then is cultured in a yeast that, when it is finished, produces a slimy sticky product. To me it looked like miniature poutine with the beans having a stringy sticky coating. It didn't taste anything like poutine. The natto I tried came with soy sauce and mustard.

I learned about the health claim that says natto can reduce the effects of hay fever.

Tofu production is a big industry in Japan and it uses the largest amount of soybeans compared to any other soy food. It uses 55% of the soybeans consumed. Tofu is made from soy milk, which is coagulated and pressed into blocks. It is high in protein and can be eaten in many different ways.

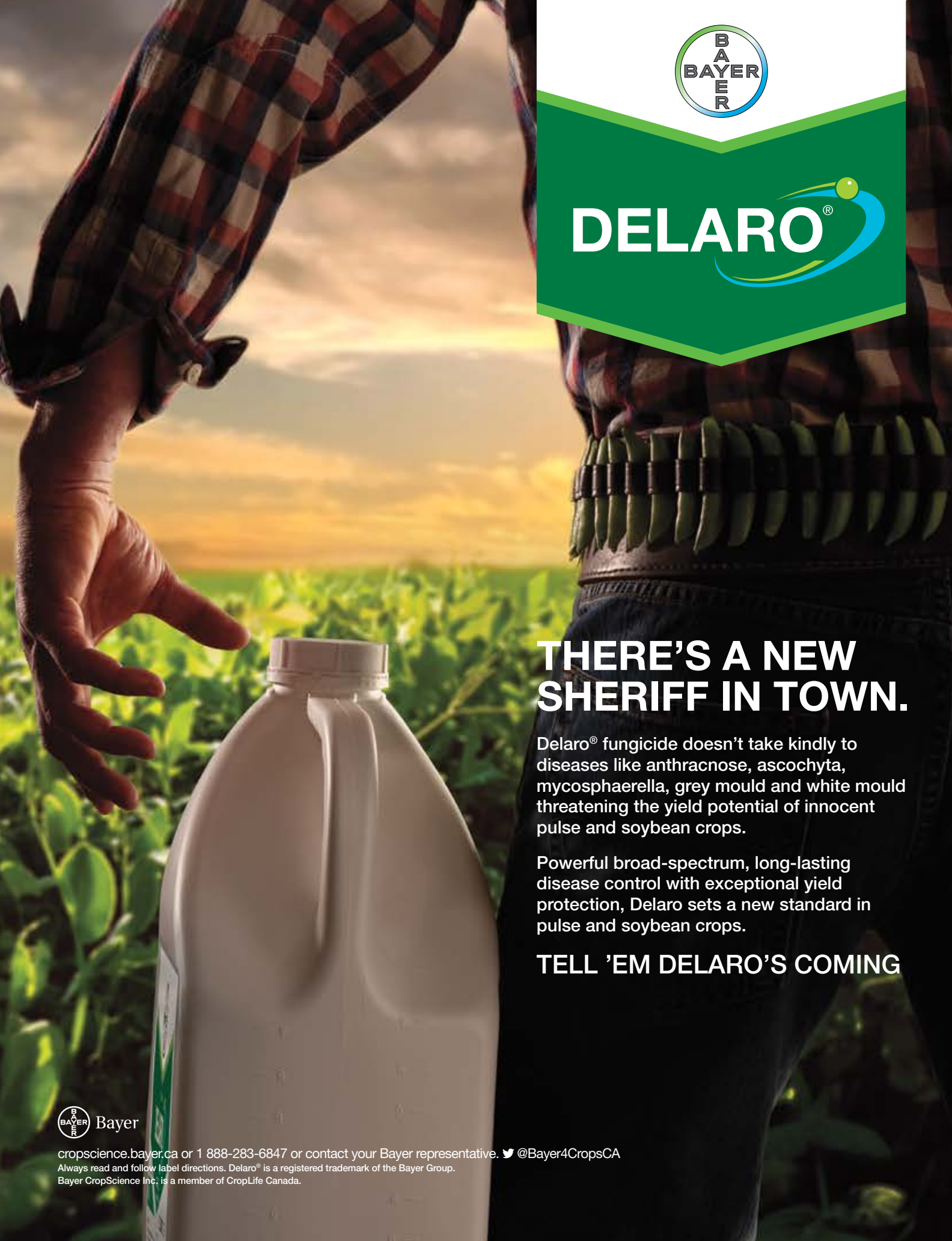
Soybeans are also used to make miso, which is made by fermenting soybeans with salt and barley or rice and then ground up into powder. You may be familiar with miso soup. Miso producers like to have high sugar content, as this helps in the fermentation process.

Soy milk consumption in Japan is growing for a number of reasons. It's a market hungry for more plant-based proteins, shying away from animal-based ones. There was a dairy milk scandal in Japan that has switched many Japanese consumers to soy milk. BSE also switched many cow milk drinkers to soy milk, which lowers cholesterol, according to a health claim I heard while in Japan.

Japan's soy processors are very traditional when it comes to the varieties of soybeans that they will use. They are resistant to new varieties. This is a challenge, as Canadian farmers need to grow the newer, higher-yielding varieties to be more profitable. This would keep the costs down for soy processors, but they like to use the older varieties without paying the premiums that are needed for farmers to cover the costs of growing lower-yielding soys.

It was an interesting trip. I learned that there is a growing demand for soybeans. As farmers and as an industry, we need to be aware of the needs of our different customers/markets, as they each have different needs.

These countries were only two examples of the soy industry's customers around the world. There are many more trips being planned by Soy Canada to keep Canadian soybean farmers competitive in the world market. ■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Ottawa Update

Fiona Cook, Executive Director, Grain Growers of Canada

HOPEFULLY BY NOW you have had the chance to take a look at GGC's new website (ggc-pgc.ca). It was launched on February 16 as part of the Canada's Agriculture Day celebrations and contains lots of information on GGC policy positions and upcoming legislation that affect grain farmers on the national level.

Here at GGC, we held two very full days of strategic planning in early April. Our goal is to be a more focused organization that delivers wins in Ottawa to the benefit of all grain farmers. We also hosted a well-attended parliamentary reception that welcomed MPs, government staff and many stakeholders for an intimate event. It is always great to get our industry together and with the buzz created by the report from Dominic Barton's Advisory Council on Economic Growth (Barton Report), the time is right for decision makers in Ottawa to focus on agriculture.

On March 22, the federal government released its second budget. For the first time in recent memory, agriculture and agri-food were singled out as drivers of economic growth. This is due mostly to the Barton Report, which recommended that the government invest in agri-food to help us achieve our potential. The budget calls for growth in agriculture and agri-food exports by at least $75 billion annually by 2025.

Surprisingly to many farmers, the budget initiated a consultation review on cash ticket deferrals to see if they could be eliminated. Following consultation with members, we determined that the ticket deferral system is valuable to a wide range of grain farmers and we are in the process of drafting a response for the May 24 deadline that will reflect the needs of the industry.

On April 12, it was reported that a Canadian Food Inspection Agency study had found that 1.3 per cent of food samples had a glyphosate level above the maximum residue limit (MRL). Health Canada analyzed the results and determined that there were no safety concerns making this a good news story, as it means that the vast majority of farmers are following specifications and keeping our grain supply safe. Growers are reminded that following the Keep It Clean protocol is the best way to ensure that your grain products are clean and help keep our international markets open. You can find out more at *keepingitclean.ca*.

Now we are looking ahead to our summer board meeting taking place July 4–7 in Moose Jaw, Saskatchewan. It is there that we will introduce our new strategic plan and direction for GGC. Having been on the job for a full year, I have learnt much about the needs of our industry and am looking forward to working together over the next year to ensure that GGC continues to be a respected voice in Ottawa on the issues that matter most to farmers. ■

10 Million Acres of Opportunity!

Jim Everson, Executive Director, Soy Canada

AFTER NINE CONSECUTIVE years of growth, the Canadian soybean sector is expected to expand yet again in 2017. In 2016, farmers in western Canada produced roughly 1.9 million metric tonnes of soybeans. 2017 production is forecast to climb to more than 3 million metric tonnes as farmers look to soybeans as a healthy and profitable crop to rotate in on their farms.

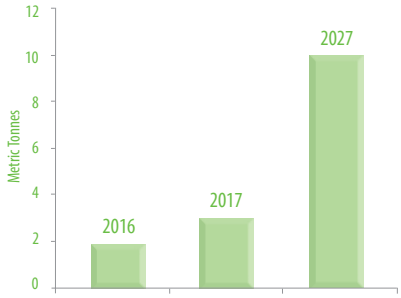
To build on this momentum, Soy Canada is developing a comprehensive strategic marketing readiness plan for the industry. Our plan, titled *10 Million Acres of Opportunity*, involves the entire soybean value-chain and sets ambitious but realistic growth targets that will guide the soybean sector over the coming decade.

First, our strategy lays out production targets. By 2027, we will increase seeded area of soybeans across Canada to 10 million acres, increase the national yield average to 48.2 bushels per acre, and increase national production to 13 million tonnes.

On natural capital, our industry will take steps to improve the natural environment that supports our industry and be recognized internationally as a leader in sustainable production of high-quality soybeans.

Building on Canada's international reputation of high-quality food-grade soybeans, our plan aims to increase food-grade production by 25 per cent over the next 10 years. To enhance our competitiveness, by 2027 we will increase the average protein levels of soybeans in eastern Canada to 41.1 percent and 40.2 percent in western Canada.

Finally, building on the explosive growth potential of the agriculture



sector identified by the Prime Minister's Economic Advisory Council, our plan will increase export of whole soybeans to 10.5 million tonnes and domestic processing capacity to 2.5 million tonnes by 2027.

In April, Soy Canada released a discussion paper outlining the framework of our strategy and our plan to get there. We are collecting feedback from value-chain members on the priorities and targets we've identified and invite you to comment on our plan. To view and download the outline of our strategy, please visit our website at *www.soycanada.ca* or contact us at *info@soycanada.ca*. ■

Soy Canada Goals and Targets

Double production in the next decade

	2016	2027
TOTAL SEEDED AREA (ACRES)	5,467,100	10,000,000
Eastern Canada	3,592,100	4,000,000
Western Canada	1,875,000	6,000,000
YIELD (BUSHELS/ACRE)	44.1	48.2
Eastern Canada	46.1	53
Western Canada	40.1	45
TOTAL PRODUCTION (TONNES)	6,462,700	13,000,000
Eastern Canada	4,491,200	5,750,000
Western Canada	1,971,500	7,250,000

Increase world-leading high-quality of food-grade production by 25%

	2016	2027
FOOD-GRADE PRODUCTION (TONNES)	1,250,000	1,800,000
SEEDED ACRES	1,000,000	1,250,000

Build on Canadian soybeans' contribution to natural capital

- Canada's soybean sector will work to improve the natural environment that supports our industry
- Be recognized in Canada and around the world as a global leader in sustainable production of high-quality soybeans

Increase competitiveness, exports and processing of commodity soybeans

		2016	2027
PROTEIN CONTENT	Eastern Canada	40.6 (35.5)	41.1 (36)
Dry matter basis (13% moisture)	Western Canada	38.7 (33.7)	40.2 (35)
Whole Soybean Exports (Tonnes)		4,500,000	10,500,000
Processing Capacity (Tonnes)		1,878,000	2,500,000

Pulse Canada

Working Toward Fumigation Resolution

PULSE CANADA IS continuing to work toward resolution of a major trade issue with India, Canada's largest pulse customer. Pulse Canada believes a long-term solution must begin with a science- and evidence-based systems approach to managing phytosanitary or plant health risk.

In late 2016, the Canadian pulse industry received indications from Indian officials that Canada may not continue to be exempt from India's requirement that pulse imports be fumigated with methyl bromide at the country of origin. Canada had been receiving regular six-month exemptions from India since 2004, in part because Canada's climate is too cold for methyl bromide to be effective. Methyl bromide is also an ozone-depleting substance banned from most uses in Canada under the Montreal Protocol.

In September 2016, India didn't renew its latest exemption for Canada until the day before it was due to expire. This caused trade uncertainty and impacted Canadian pulse exports to India – which account for more than one-third of Canada's total pulse exports. Canadian government and pulse industry representatives travelled to India in March as part of an extensive outreach effort to resolve the issue. Canadian government representatives included Federal Agriculture Minister Lawrence MacAulay, Federal Trade Minister François-Philippe Champagne and many other senior officials. On March 30, Canada was granted an additional three-month extension to India's fumigation exemption. Under the previous exemption, shipments had to arrive in India prior to the deadline (which was March 31) to receive the exemption. The current exemption deadline is June 30, which applies to official documents issued when the shipment leaves Canada, rather than the date of shipment arrival in India.

Just as the Canadian pulse industry received temporary relief from the fumigation issue in India, exporters started facing similar trade impediments in Pakistan when officials began requiring all grain shipments be fumigated at point of origin rather than point of arrival. This problem also received a short-term fix. In May, Canada's exemption from Pakistan's fumigation requirements was also extended; it will expire on November 30. This exemption is also expected to apply to documents issued when the shipment leaves Canada rather than the date of arrival in Pakistan.

The issues in India and Pakistan over the last few months demonstrate that temporary fumigation exemptions are not an acceptable long-term solution. The key to the solution is having Canada's systems approach to mitigating phytosanitary risks recognized as being equivalent to a blanket fumigation requirement. The strength of Canada's systems approach lies in the many checks and balances in the value-chain as well as regulatory oversights, cold Canadian winters and corrective actions through fumigation in rare cases where quarantine pests are detected. The combined effect of these factors brings the probability of a phytosanitary risk, such as stored grain pests, to virtually zero.

Since December 2016, Pulse Canada has been working with the Canadian Food Inspection Agency (CFIA) on behalf of the pulse industry to develop systems approach packages for India and Pakistan that outline the procedures and practices used to ensure that Canadian export shipments of grain meet importing countries' requirements, just as Canadians expect that imported products don't

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Clancey's Stats

Brian Clancey, Senior Market Analyst and Publisher, STAT Communications

PRODUCTION OF ALL classes of dry edible beans in Canada and the United States will be up over last year if growers stick with their seeding decisions and the region experiences average yields.

On the other hand, given the current pace of export demand and domestic usage, this summer's carryover will be smaller than last year, with the result combined supplies of beans in the two countries could be down 3% at 1.56 million metric tonnes (MT).

Significantly, this is down 5% from the recent average supply of beans, suggesting that stocks will remain relatively tight over the coming marketing year.

In this year's seeding intentions report, Statistics Canada said farmers in that country intend to reduce land in beans from 277,000 to 260,000 acres. While dry edible bean area is expected to be up in Ontario, farmers in Manitoba said they will cut coloured bean area from 90,000 to 70,000 acres and white beans from 27,000 to 20,000 acres.

Manitoba's reduction is part of a general trend towards reduced production of dry pulses. Field pea area is expected to sink from 165,000 to 40,000 acres while virtually no lentils will be grown. Instead, farmers say they will plant a record 2.2 million acres of soybeans, up from 1.64 million last year.

There is still more upward potential for soybean area in Manitoba, but provincial agronomists think it is limited. On the other hand, Saskatchewan has not reached its upper limit for the crop. More importantly, ongoing plant breeding efforts suggests the acreage potential for the province will increase further over the coming decade.

Farmers in Saskatchewan intend to plant 730,000 acres this year, up from 230,000 last year. That puts them on par with where Manitoba was in 2012, when seeded area jumped from 575,000 acres in 2011 to 800,000.

Just as was the case in Manitoba, gains in soybean area will come at the expense of dry pulses and other crops. Aphanomyces has become a significant problem in the province because farmers have been pushing lentil and field pea rotations.

At the present time, the only way to defeat the disease is to wait six and eight years before planting peas, lentils, dry beans or alfalfa on the same land. To keep pulses in a three to four year rotation, farmers need to include soybeans, faba beans or chickpeas. Those crops have good resistance to the disease.

Manitoba has the potential to approach three million acres of soybeans annually or about a third of the cropped land. Getting there would require another major shift in crop choices.

Saskatchewan has the land to plant more soybeans than Manitoba, suggesting western Canada will one day grow more soybeans than eastern Canada. But, that will also require a significant shift in what farmers grow. As soybean area expands, growers in that province will also face problems controlling volunteer Roundup Ready canola.

It could be argued that to a certain extent the expansion in soybean production in the United States this year has contained prospective growth in dry edible bean area. The dry bean industry is also facing increased competition for land use from peas, lentils and chickpeas in some states.

For growers, crops that offer competitive returns per acre after accounting for production and marketing risks tend to be more attractive. Most of the North American crop is destined for domestic canners and packagers, who increasingly need to know how and where their ingredients were produced.

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present risks of introducing new pests to farms in Canada. In addition to describing the complete system, the package demonstrates how Canadian farmers protect their commodities from phytosanitary risks by following best practices when it comes to grain handling, on-farm storage and other features. This includes monitoring grain temperature and moisture levels, using grain storage bin aeration fans to reduce temperature and moisture content, inspecting grain samples for pests, and controlling stored grain insects through the use of bio-insecticides or fumigations.

The information package sent to India and Pakistan also details the steps taken by Canadian exporters to prevent phytosanitary risks through the sampling and inspection of grain deliveries prior to unloading them, and through participation in rigorous food safety certification programs such as Hazard Analysis and Critical Control Point (HACCP). The package also documents the role of government agencies such as the CFIA and the Canadian Grain Commission (CGC), as well as third-party inspection companies such as SGS and Intertek, in conducting facility inspections and sample testing programs.

At press time, Pulse Canada had received a draft notification from India suggesting that the country is willing to accept Canada's systems approach, but will also monitor it over the coming years. Fumigation continues to be proposed but with phosphine in lieu of methyl bromide. While phosphine doesn't have the same harmful environmental effects as methyl bromide, the temperatures needed to fumigate with phosphine are too low in Canada for part of the year. Pulse Canada is working with the Canadian government to communicate these concerns to Indian officials and identify effective solutions that will address both countries' concerns. Pulse Canada continues to support the Government of Canada in reaching a long-term resolution to the issue in this key Canadian pulse export market. ■

Farmer Profile

Bryce MacMillan

Toban Dyck, Director of Communications, MPSG

BRYCE MACMILLAN WAS mid-sentence when the alarm sounded. It wasn't loud. But it was unfamiliar to him. It was his house trying to tell him something.

Bryce and his wife, Kristen, the former production specialist at Manitoba Pulse & Soybean Growers (MPSG), live in a newly built house that from top to bottom exemplifies their commitment to best practices – doing things right and doing things that will last.

"Sustainability. It is the way things are going," he said. "At the end of the day, if you're not doing something that is sustainable, then why are you doing it?"

Bryce found the alarm and silenced it. It was connected to a weather monitor that had just been installed.

My interview with Bryce, who was elected to MPSG's Board of Directors at the association's AGM this February, hung in the balance of a rain day, which arrived and stalled his farm's planting efforts just long enough for a chat. And it was a great chat.

"Things seem to be changing so quickly these days," said Bryce. "There is a lot more focus on sustainability in farming. More farmers are concerned with research and the younger generation seems to care more about what the public thinks. That's the perspective I hope to bring to the board."

Bryce is the youngest in a family of boys. He runs a multi-generational family farm alongside his dad and eldest brother near Marquette, Manitoba. Together, they own a dairy operation and crop slightly more than 3,000 acres.

"We're off to a great start," he said. "It's the first week of May and more than half the farm is in the ground. We should have everything in by the second week in May, whether that's good or bad."

Bryce had his eyes on MPSG's board for quite some time, seeing a tremendous opportunity to learn about all aspects of the agriculture industry. He also saw an opportunity to effect positive change for farmers in Manitoba.

"We started growing soybeans in 2012," he said. "It was a growing trend and a sustainable addition. I wanted to be a part of that growth, asking questions along the way.

"Another thing that really drew me to MPSG is its unbiased attitude. I think farmers sometimes forget that being unbiased is the role of all commodity groups. We are not influenced by industry. I really like how there is a group out there that is genuinely providing for the farmer. MPSG is

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The resulting long-term relationships benefit processors and growers. But may limit opportunities for new entrants. This has raised questions about the sustainability of production and possibly contributes to efforts to expand the usage of other types of pulses and their fractions in manufactured foods.

Average annual dry edible bean area in Canada and the United States has been trending downward. It averaged 2.2 million acres between 1996 and 2000; 2.02 million in the five years ending in 2005; but only 1.82 million between 2001 and 2005. Since 2014, area has pushed back over two million acres per year, suggesting the down trend has been reversed. Trend forecasts suggest that is the case, with area having the potential to average over 2.1 million acres by 2020. Canada could become less important, largely because soybeans appear to be more attractive to dry edible bean growers in Manitoba and may dissuade prospective growers in Saskatchewan. ■

Pulse Production Summary

Area (acres)	2012	2013	2014	2015	2016	2017
Canada	305,000	240,000	305,000	260,000	277,000	260,000
United States	1,742,800	1,360,000	1,701,600	1,764,700	1,729,000	1,941,200
Total	2,047,800	1,600,000	2,006,600	2,024,700	2,006,000	2,201,200
Production (metric tonnes)						
CANADA						
• Coloured	158,800	140,700	195,400	168,500	188,400	173,000
• White	115,600	65,400	77,700	75,000	69,200	68,000
Cdn Total	**274,400**	**206,100**	**273,100**	**243,500**	**257,600**	**241,000**
UNITED STATES						
• Pinto	613,898	384,922	448,562	431,008	437,177	471,102
• Black	169,600	115,440	178,490	253,515	197,768	188,982
• Navy	222,535	154,314	193,822	206,931	159,485	172,683
• Great Northern	55,430	68,720	108,183	41,504	38,329	62,255
• Other	235,508	229,928	255,012	316,429	284,150	287,522
U.S. Total	**1,296,970**	**953,325**	**1,184,070**	**1,249,388**	**1,116,909**	**1,182,544**
Total Production	**1,571,370**	**1,159,425**	**1,457,170**	**1,492,888**	**1,374,509**	**1,423,544**
Opening Stocks	113,000	326,000	194,000	255,000	237,000	137,000
Total Supply	1,684,370	1,485,425	1,651,170	1,747,888	1,611,509	1,560,544
Rolling Average	1,523,722	1,545,463	1,533,192	1,570,777	1,572,115	1,636,072

BASED on data from USDA, Statistics Canada and STAT Publishing

continued from page 16

that. There is an abundance of people running around with products. And, in the farming world, those people have access to a lot of farmer money. MPSG is not selling anything. You can confidently rely on MPSG for best practices."

Bryce's farm has implemented many of MPSG's research-based recommendations and his farm has saved a lot of money as a result. This year, he will be treating only about 30 per cent of his soybean seed. And MPSG is responsible for that.

"I would have never made that decision without research to back it up," he said. "We were seeding over 200,000 plants – we're cutting back solely based on research. And it doesn't stop there. There are many more examples of how MPSG research has saved my farm money."

Bryce represents an important demographic in the farming community: young farmers, who are curious, engaged, attuned to issues surrounding public trust and have an insatiable appetite for research.

Market access and making sure agriculture students in our universities know about MPSG are critical, according to Bryce.

"We need to be going after the young farmers. Educating them before they get stuck in their ways," he said. "MPSG also needs to continue working on market accessibility, looking for opportunities, keeping those conversations alive and the ball rolling."

He would like to see the association make these goals a priority, along with continued work on making sure farmers have access to the information needed to make their farms as sustainable as possible.

"There is a lot more interest now in the care of the land. Sometimes, markets drive what farmers grow. And I don't think that is right. What should be the driver is best practices and profitability. Healthy soils and good crop rotation will be more profitable in the long term."

In 2008, after Bryce graduated with an Agriculture Diploma from the University of Manitoba, he spent about five months working off the farm, gaining invaluable experience that ultimately led to his full commitment to joining the family operation.

In 2010, he purchased 80 acres of land near the farmstead, and in 2016/2017, Kristen and Bryce built a house on it, which, in keeping with their commitment to sustainability, received an Energy Guide rating of 88 per cent from Manitoba Hydro.

"Whether it's peas in their rotation or putting N back in the soil. Whether it's cover crops, or a whole host of other challenges, lots of people are going to be turning to MPSG," said Bryce. "MPSG instills confidence. When you have a question, ask MPSG. It's stuff you can depend on and stuff you can trust."

The interview ended as it began: I had questions about their house and he answered them. The exposed oak timbers continually distracted me. So did the old barn door they had repurposed to use indoors. ■

Reducing Soybean Harvest Losses in Manitoba

The Bean Report
Your source for soybean and pulse crop agronomy and research

Cassandra Tkachuk, MSc, Production Specialist, MPSG

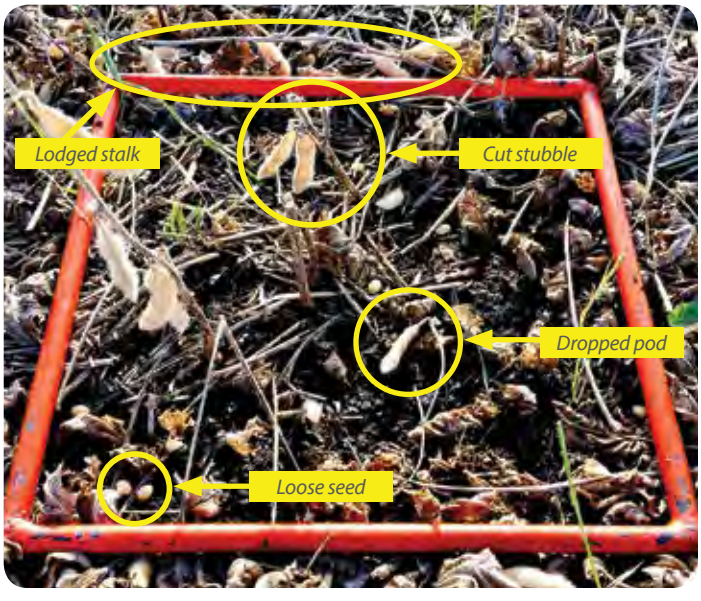
ARE WE HARVESTING soybeans efficiently in Manitoba? Do speed, header type and harvest angle matter when it comes to combining soybeans? These are questions that the Prairie Agricultural Machinery Institute (PAMI) and MPSG have been working to address in Manitoba.

HEADER LOSSES

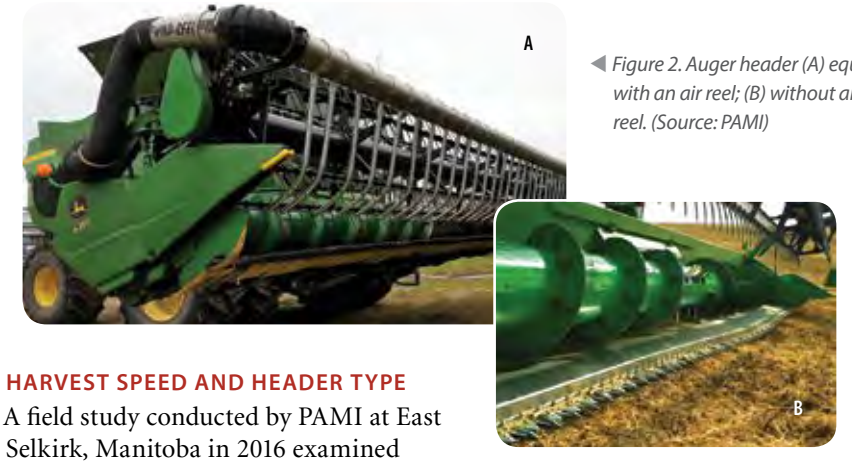
It is estimated that 80% of soybean harvest losses occur at the header, which can have a significant impact on net return. Header losses occur during gathering (the feeding of soybean plants into the header), prior to threshing. There are four types of header losses (Figure 1):

1. **Shatter** – seeds and pods shattered by the cutter bar
2. **Loose** – stalks that were cut, but not delivered into the combine
3. **Stubble** – pods that remain attached to cut stubble
4. **Lodged** – stalks that were lodged, rather than severed by the cutter bar

The primary causes of header losses are shatter and pod drop.[1, 2]



▶ *Figure 1. Loose seed, cut stubble, lodged stalk and dropped pod losses. (Source: PAMI)*



◀ *Figure 2. Auger header (A) equipped with an air reel; (B) without an air reel. (Source: PAMI)*

HARVEST SPEED AND HEADER TYPE

A field study conducted by PAMI at East Selkirk, Manitoba in 2016 examined the effects of combine speed and use of an air reel on soybean header loss. The study tested four combine speeds: 2, 3, 4 and 5 mph. It also examined auger headers with and without an air reel (Figure 2). The experiment was randomized and replicated.

Soybean header losses were low when combine speeds were 2, 3 and 4 mph. These three speeds resulted in similar soybean header losses.[2] However, losses at 5 mph were nearly 40% (0.69 to 0.82 bu/ac) greater than all other speeds (Figure 3). Therefore, slowing down the combine may cost you a bit more time, but it can put more seed in the bin and save you money. Assuming a soybean grain price of $10/bu, loss of revenue was $8.20/ac at 5 mph compared to the slowest combine speed. In addition, reduced harvest speed allows the cutter bar to run closer to the ground more safely, reducing stubble losses.[1]

This study also showed the benefit of harvesting soybeans with an air reel. Soybean header losses with and without an air reel in this study were 1.02 and 2.27 bu/ac, respectively (Figure 4).[2] This means that using an air reel could prevent 1.25 bu/ac of header losses during harvest, equal to a savings of $12.50/ac (at an assumed grain price of $10/bu).

It is important to note that these results are from only one site year of data. But there is tremendous potential to reduce soybean harvest losses and increase economic return through improved header use.

In 2017, PAMI will continue this research, examining combine speeds and draper headers with and without an air reel.

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Figure 3. The effect of combine speed on revenue loss and soybean header loss. (Source: PAMI)

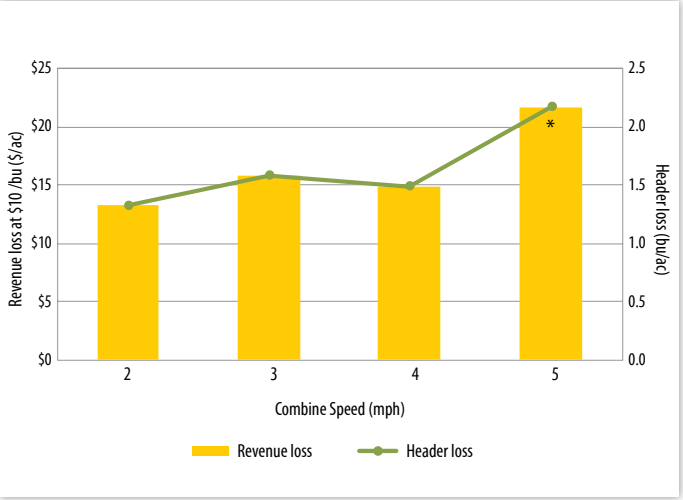
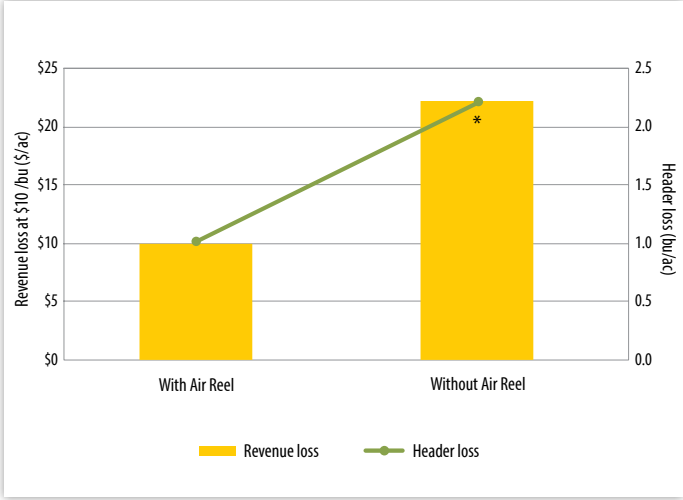


Figure 4. The effect of auger headers with and without an air reel on revenue loss and soybean header loss. (Source: PAMI)



HARVEST ANGLE

Another randomized, replicated field study conducted by PAMI near Tyndall, Manitoba in 2015 evaluated the effect of harvest angle on soybean header loss. Two soybean varieties (Dekalb 23-60RY and 24-10RY) were harvested at 0° and 45° angles to the rows using a draper header.

There was no conclusive evidence from this study that soybean harvest losses were reduced by combining at a 45° angle. However, harvesting at a 45° angle provides the benefit of distributing the cutting load across the entire header. In-line harvesting (0° angle), on the other hand, can increase wear on cutter bar knives by heavily loading knife sections, and under-utilizing combine capacity.

This study provided evidence that optimal combine settings differ among soybean varieties. However, more research on this topic is needed.

SOYBEAN HARVESTING TIPS

- Monitor soybeans every other day once they begin to mature. Consult the MPSG *Soybean Maturity Guide* to help time your harvest.
- Avoid harvesting soybeans at less than 13% moisture to avoid seed damage.
- Direct combine soybeans with a flex header at 4 mph or less.
- Adjust the cylinder speed and concave clearance carefully to prevent seed cracking and splitting.
- Aim to lower the cutter bar within two inches of the ground to capture the lowest pods, preventing stubble losses.
- Measure losses regularly during harvest to optimize your combine settings.

Watch for our new Bean App tool – the *Harvest Loss Estimator* for soybeans! ■

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HOW TO MEASURE SOYBEAN HARVEST LOSSES

1. Stop the combine and back up 15–20 feet.
2. Lay out a quadrant (e.g., ft^2) or hula hoop (e.g., 28.4" diameter equals 1/1000th of an acre) in at least four areas along the header.
3. Record the number of beans in all areas, accounting for all types of header loss.
4. Calculate the average number of beans across all sample areas.
5. Divide the average number of beans by the area (e.g., ft^2), then divide by four to calculate header loss in bu/ac. As a rule of thumb, 4 beans/ft^2 equals 1 bu/ac, which can be used as a conversion factor in this case.

A similar method can also be used to measure threshing losses behind the combine.

Building a Research Program

Kristen Podolsky MacMillan, MSc, PAg, Research Agronomist, University of Manitoba

MAY 1 WAS a beautiful day for seeding soybeans and was the start of #plant17 for many farmers across the province. My research crew hit the field in late April – soil sampling, cultivating and flagging to set up our research plots in Carman. The first experiment to be seeded was *Soybean Seeding Windows* where we will plant soybeans within four generalized seeding windows to further refine seeding date recommendations.

Rewind and it's hard to believe six months ago I was wrapping up files at MPSG, sending out my last *Bean Report* and preparing to begin a new adventure at the University of Manitoba. Coming to the university was a bit of a homecoming you might say, as I completed my undergraduate and graduate work here not too long ago. Returning as an academic rather than a student, and interacting with my colleagues who have been my professors and advisors has been gratifying. I've been welcomed by all and look forward to contributing to the faculty.

I came to the university with two things in tow: a laptop and a mission to build an applied agronomy research program focusing on soybeans and pulses. In my interview, I laid out broad objectives for the program and when you get caught up in the excitement of getting to where you're going, the daily grind becomes busy. Part of the daily grind is navigating all the university policies and procedures, which albeit critical for accountability, can be limiting when flexibility is needed to accommodate diverse programs. There is no one size that fits all. Regardless, my first priorities were to acquire land, seed, equipment and people. To do this, I connected with my colleagues, industry partners and set things in motion. Overall the process went nearly flawless – I now have a lab space occupied by two motivated and skilled technicians (Mike and Geertje), trials are going in the ground and when you are reading this, it will be spraying time.

In building this research program and deciding on projects and activities, there are several questions I ask myself: What agronomy questions are we asking today? Five years from now? Do we have existing knowledge but lack effective technology transfer? How do you design an experiment to address the question while balancing the agronomic, economic and environmental considerations? Where should the experiment be located – does a research station and target audience coincide?

A lot of university field research is conducted at the Ian N. Morrison Research Farm in Carman where field-based programs have land allocations and equipment. It's like many farms co-existing and sharing resources when it makes sense to do so. My program will have some experiments at Carman, but we will be spread out across the province. Logistically, because we don't have our own equipment but also strategically to reach different regions and audiences. In 2017, we will have research in Arborg, Beausejour, Carman, Melita, Morden and Portage la Prairie and will expand next year. To facilitate research outside of Carman, I will collaborate with Manitoba Agriculture, AAFC, contract research groups, industry and farmers. Agricultural research has decentralized over the years, in part due to the On-Farm movement, but there is more work that can be done to develop BMPs in each of the major agro-regions of Manitoba.

In addition to public research, the university is a place of teaching and higher education where young farmers and agronomists come to gain knowledge, experience and inspiration. As an agronomist, researcher and farmer, I'm in a unique position to help shape the student experience. I've had several opportunities to engage with diploma students and look forward to seeing how this aspect of my position evolves. This summer, I look forward to training a summer student (Lina), as part of our research crew and providing graduate students with the opportunity to participate in field research by assisting with our hail damage trials.

Since it is the first growing season as a new research team and program, I anticipate there will be kinks to work out. It's like on the farm this year where we have a new seeder and GPS. It took twice as long to seed the first quarter, but after proper calibration and training to understand the new functions, the system will allow us to be more efficient and profitable. This is the same outcome I have for my research to help you as farmers and advisors. You can keep up to date with my program on Twitter (@kristenpodolsky) or catch us at a field tour this summer. ■

▼ Agronomy questions being explored in 2017

1. Should we be planting soybeans earlier?
2. What is the optimum nitrogen rate for dry beans?
3. How does hail damage affect soybean productivity?
4. How does stubble type affect dry bean productivity?
5. Can we plant soybeans beyond current seeding deadlines?
6. How do fungicide products and timing compare in soybeans?

Do you know about the Agronomy Engagement Program?

Tools and resources delivered right to you!

MPSG invites agronomists to sign up for the Agronomy Engagement Program. We'll share what MPSG can offer in terms of production resources, research and extension events to help you better serve your farming customers.

To join the network for 2017, contact Jake: **jake@manitobapulse.ca**

MPSG's 2017 Approved Funding for Research

Support for soybean agronomy, research capacity and the On-Farm Network increases

MPSG SAW AN overwhelming number of quality research proposals in 2017 and is excited to initiate a suite of new soybean agronomy projects. Long-standing questions such as, "will my soybeans respond to potassium fertilizer?" will be answered with research being conducted by both academics and farmers.

The *On-Farm Network* is in a year of transformation. Additional staff means more projects are being conducted and assistance for trial implementation will be more accessible to farmers in every corner of our province. Trial locations could exceed 70 fields! MPSG is offering thirteen On-Farm projects covering soybean, dry bean and pea agronomy, testing inoculants, fungicides, seed treatments and fertilizers.

Supporting discovery-type research remains a core activity of MPSG. Seventeen projects led by various scientists at public institutions will aim to develop and validate production recommendations and tools, improve varieties and create new marketing opportunities.

Dr. Mohr's work at Agriculture and Agri-Food Canada will continue to investigate best management practices for soybean crop establishment. Factors like seed quality will be tested in various soil temperatures. Residue management trials will be expanded in western Manitoba, where no-till soybean acres are continuing to establish, testing cereal residue burning, tillage and stubble height in an effort to identify practices that could accelerate crop establishment and maturity or increase yields.

The buzz around growing cover crops south of the border has stimulated discussion amongst many keen farmers and agronomists in Manitoba. However, questions remain: What species will work here? What benefits will we see? In 2017, Dr. Lawley at the University of Manitoba (U of M) will initiate a project to determine what cover crops and seeding dates will provide utility in local rotations. Crops such as dry beans, peas or soybeans leave little residue behind and have long windows in fall or spring with no crop growth. These crops offer the perfect opportunity to inject

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a cover crop in the rotation and build soil health!

Crop rotation trials give us the chance to monitor changes in pest pressure over time, holding all other factors, like soil type and local weather conditions, constant. Several established crop rotation studies at Carman and Brandon are now at a stage in which we can exploit the trials to measure the effect of crop rotation on overwintering rhizobia populations, root rots, foliar diseases and weed species. What we hope to unearth are the most profitable and effective crop sequences, ones that minimize the need for additional pest management practices.

Soybean Cyst Nematode (SCN) is a pest that we have been watching for quite closely. The SCN survey will be conducted again this summer by the U of M Soil Ecology lab, and Dr. Tenuta's team will be putting the finishing touches on a soil PCR test, which will radically improve the accuracy and sensitivity of SCN soil testing capabilities. Though the movement of the pest into Manitoba seems inevitable, with early detection farmers could keep the pest below economically damaging levels using the right management practices.

The Research Agronomist in Residence program is a new program supported by MPSG, Manitoba Agriculture and the U of M. Kristen Podolsky MacMillan's applied research and extension will complement the expertise in the Faculty of Agriculture and will work to fill the niche of soybean and pulse crop agronomy. For more detail about the program, see page 20.

MPSG's investment in discovery-type and on-farm research means farmers benefit from both research opportunities. We can use small plots to test a number of treatments and take detailed measurements to determine the mechanism of response to an input – the "how" and "when." Once we narrow down the best treatments – a product or application timing, for example – we can test that treatment over a number of farming systems to validate the small plot results, determine the frequency of response to the input, and make broader production recommendations for farmers across the province.

We would like to thank and applaud the farmers and scientists who invest their time in soybean and pulse research. Your contribution to a profitable and sustainable industry has not gone unnoticed!

In addition to investing in research, a portion of the annual budget is allocated to production support and extension. Staff at MPSG will also expand their involvement in transferring research results through extension events such as MPSG's *SMART* field day, *Getting it Right* meeting and *Soybean Stop* to give our members the chance to learn about the results of their research investment and its on-farm applications. New production resources and Bean App tools are in the works, too. Sign up to receive *The Bean Report* to keep connected with MPSG and learn about what is new in pulse and soybean production.

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RESEARCHER	PROJECT	START	END	MPSG TOTAL FUNDING	TOTAL VALUE
	ON-FARM NETWORK				
TAC	Soybean Response to Foliar Fungicide	2017	2017	$23,625	$23,625
TAC	Soybean Response to Fungicide and Insecticide Seed Treatment	2017	2017	$22,575	$22,575
TAC	Comparing Accuracy of Yield Data between Calibrated Yield Monitor and Scale	2017	2017	$5,513	$5,513
MPSG	Soybean Response to Potassium Fertilizer	2017	2017	$50,000	$50,000
Antara	In-furrow SoyGreen for IDC in Soybean	2017	2017	$9,923	$9,923
Antara	Foliar SoyGreen for IDC in Soybean	2017	2017	$6,615	$6,615
Agri Skills	Suitability of Pinto Bean Varieties for Direct Harvest	2017	2017	$20,000	$20,000
MPSG	Evaluation of Single vs. double Inoculation Strategies for Soybean – Western Manitoba	2017	2017	–	–
MPSG	Field Pea Response to Foliar Fungicide	2017	2017	–	–
MPSG	Dry Bean Response to Foliar Fungicide	2017	2017	–	–
TAC	Effects of Seed Applied Inoculant on Soybean Yield	2016	2017	$84,000	$84,000
TAC	Effects of Lower Seeding Rates on Yields – Western Manitoba	2015	2017	$75,600	$75,600
U of M – Lawley	Soybean Residue Management	2014	2017	$68,616	$255,850
	SOYBEAN – Agronomy				
AAFC – Mohr	Management Practices to Optimize Establishment and Early-Season Growth of Soybean	2017	2019	$144,022	$144,022
U of M – Gulden	Rotational Effects and Optimized Plant Spatial Arrangement for Wheat Production in Manitoba	2017	2020	$82,800	$349,140
U of M – Costamagna	Determining the Role of Crop and Non-Crop Habitats to Provide Sustainable Aphid Suppression in Soybean	2017	2019	$107,838	$215,677
U of M – Flaten	Soybean Response to Potassium Fertility and Fertilizer in Manitoba	2017	2018	$85,226	$170,453
U of M – Tenuta	Manitoba Survey and Molecular Quantification of Soybean Cyst Nematode	2017	2018	$121,612	$243,225
U of M – Lawley	Cover Crop Strategies for Dry Bean and Soybean Crops in Manitoba	2017	2019	$195,444	$195,444
U of M – Lawley	Predicting Soybean Phenology in Manitoba	2017	2019	$96,400	$192,800
U of M – Oresnik	Frequency of Soybean Rotation and Persistence of Rhizobia in Manitoba Soils	2017	2018	$68,700	$68,700
PAMI – Simundsson	Seed Mortality Due to Air Seeder Damage	2017	2017	$40,660	$90,660
U of M – Paliwal	Determination and Modelling of EMC Characterisitics for Manitoba-Grown Soybeans	2017	2017	$32,746	$32,746
AAFC – Mohr	Enhancing Manitoba Soybean Yield and Quality under Sub-Optimal Conditions	2017	2017	$54,165	$54,165
AAFC – Mohr	Sustainable Soybean Cropping Systems for Western Manitoba	2017	2021	$98,325	$196,651
AAFC – Mohr	Effect of Preceding Glyphosate Application on Nutrient Levels in Soybean	2017	2017	$58,466	$58,466
Linnaeus – Eynck	Relay-Cropping of Winter Camelina and Short-Season Soybeans	2016	2017	$7,000	$10,000
MB Ag – Gaultier	Manitoba General and Herbicide-Resistant Weed Surveys	2016	2017	$8,078	$121,862
U of M – Gulden	Defining and Refining the End of the Critical Period of Weed Control in Soybean for Manitoba	2016	2017	$57,500	$115,000
U of M –Oresnik	Determing Efficacy of qPCR to Determine *Bradyrhizobium japonicum* Populations in Fields	2016	2017	$26,443	$52,885
U of M – Podolsky MacMillan	Soybean Hail Damage Re-Growth Assessment	2015	2017	$44,710	$132,030
U of M – Podolsky MacMillan	Late Planting of Early Maturing Soybeans	2015	2017	$25,719	$51,438
U of M – Tenuta	Soybeans for Improved Soil Health	2014	2017	$322,348	$322,348
AAFC – Mohr	Effect of Soil Temperature at Different Planting Dates and Residue Management on Soybean	2014	2017	$49,600	$148,800
AAFC – Larney	Comparison of Dry Bean and Soybean for Agronomic Traits, Inputs, Diseases and Nitrogen-Fixing Benefits to Following Crops, Water Use and Harvest Losses	2013	2017	$15,000	$59,087
	SOYBEAN – Pathology & Variety Improvement				
U of M – Daayf	Frequency of Soybean Rotations: Exploring Root Rot and Foliar Pathogens	2017	2018	$106,000	$106,000
BU – Cassone	The Most Comprehensive Survey of Foliar Diseases in Manitoba Soybean	2016	2018	$112,509	$112,509
U of M – Daayf	Characterizing the Fusarium Species that Affect Major Crops in Manitoba	2016	2017	$47,400	$174,800

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2017 Approved Funding for Research continued from page 23

RESEARCHER	PROJECT	START	END	MPSG TOTAL FUNDING	TOTAL VALUE
SOYBEAN – Pathology & Variety Improvement continued					
U of M – Stasolla	Enhancing Water Stress Tolerance in Soybean Through Phytoglobin Manipulations	2016	2018	$123,000	$173,000
AAFC – Hou	Soybean Protein Content Variation Among Genotypes Grown in Manitoba and Ottawa	2015	2017	$144,000	$144,000
AAFC – Savitch	Supporting Western and Northern Expansion of Soybean and Corn in Canada	2015	2016	$42,525	$147,050
LU – Belzile	SoyaGen: Improving Yield and Disease Resistance in Short-Season Soybean	2015	2018	$160,000	$375,000
AAFC – Morrison	Variation in Soybean Seed Quality Parameters: The Manitoba Advantage	2015	2016	$62,400	$134,400
U of M – Daayf	Alternatives to Reduce Root Rots in Soybean and Other Pulses	2014	2017	$105,000	$240,000
AAFC – Cober	Short Season Soybean Improvement and Very Short Season Herbicide Tolerant Soybean Development	2013	2017	$90,000	$748,535
AAFC – McLaren	Prevalence, Incidence and Virulence of Phytophtora Root Rot of Soybean in Manitoba Soybean Fields	2013	2017	$300,000	$683,908
	DRY BEAN – Agronomy				
U of M – Gulden	Optimizing Plant Spatial Arrangement and Weed Management for Field Bean Production	2015	2019	$236,325	$236,325
U of M – Tenuta	Identification and Significance of Plant Parasitic Nematodes of Pulse Crops and Soybean	2013	2017	$165,776	$770,158
U of M – Ayele	Mitigating the Deleterious Effects of Above Normal Soil Moisture on the Productivity of Pulse Crops Through Seed Treatment	2014	2017	$80,000	$80,000
U of G – Gillard	Dry Bean Agronomy and Pest Management Studies	2013	2017	$50,000	$969,915
	DRY BEAN – Pathology & Variety Improvement				
AAFC – Hou	Evaluation and Selection of Azuki Beans for Adaptation and Production in Manitoba	2017	2019	$108,000	$108,000
CGC – Wang	Effect of Cultivar, Growing Location and Year on Dietary Fibre Content, Typsin Inhibitor Activity and Oligosaccharides in Manitoba-Grown Dry Beans	2016	2017	$43,200	$43,200
AAFC – Marsolais	Developing Herbicide Tolerance in Dry Beans	2013	2017	$50,000	$368,550
AAFC– Hou	Development of Dry Bean Cultivars and Germplasm with High Yield, Disease Resistance and Marketable Seed Quality for Production in Manitoba	2013	2017	$325,000	$695,129
AAFC – Conner	Identify Advanced Dry Bean Breeding Lines or Coop Entries with Resistance to Common Bacterial Blight, Anthracnose and White Mould. Delvelop New Methods for Controlling Halo Blight in Dry Beans	2013	2017	$75,000	$203,993
AAFC – Conner	Evaluation of Root Rot Resistance in Dry Bean Cultivars	2013	2017	$60,000	$60,000
AAFC – McLaren	Root Rot Pathogens of Dry Bean: Identification, Distribution and Risk Assessment in Manitoba	2013	2017	$45,000	$366,947
	FIELD PEA				
AAFC – Conner	Evaluation of Root Rot Resistance in Field Pea Cultivars	2013	2017	$10,000	$40,000
AAFC – McLaren	Root Rot Pathogens of Field Pea; Identification, Distribution and Risk Assessment in Manitoba	2013	2017	$45,000	$153,100
	NUTRITION & END-USE				
RRC – McRae	Investigating Factors Influencing the Quality of Cooked Whole Beans	2017	2017	$8,209	$15,354
U of M – Jones	Comparison of Roasted Pulse Snacks, Pulse Chips and Commercial Snacks on Post-Prandial Food Intake, Appetite and Glycaemic Response in Healthy Young Adults	2017	2017	$21,178	$118,795
CIGI – Soiwnyk	Effect of Genotype and Environment on Pulse Flour Quality and Baking Performance	2016	2017	$25,000	$425,001
CCARM – Zahradka	Effect of Processing on Health Benefits Associated with Bean Consumption	2016	2017	$67,907	$123,032
CCARM – Zahradka	Cardiovascular Health Benefits of Soybean Crops	2016	2016	$18,500	$73,000
MSVU – Luhovy	The Effect of Whole Cooked Beans and Peas on Satiation, Satiety and Food Intake in Children	2015	2017	$15,800	$15,800
U of M – Aluko	Extraction and Functional Characterization of Choloesterol-Binding Indigestible Proteins from Manitoba-Grown Pulses	2015	2017	$91,300	$91,300
FDC – Appah	Developing Pulse-Based Shelf Stable Chili Using Retort Processing	2015	2016	$29,000	$32,000
2017 NEW PROJECT FUNDING				$1,568,041	$2,498,548
TOTAL PROJECT FUNDING COMMITMENTS				**$4,972,297**	**$11,608,100**

AAFC – Agriculture and Agri-Food Canada
Antara – Antara Agronomic Services
BU – Brandon University
CCARM – Canadian Centre for Agri-Food Research in Health and Medicine
CGC – Canadian Grain Commission
Cigi – Canadian International Grains Institute
FDC – Food Development Centre
Linnaeus – Linnaeus Plant Sciences
LU – Laval University
MB Ag – Manitoba Agriculture
MPSG – Manitoba Pulse & Soybean Growers
MSTVU – Mount Saint Vincent University
PAMI – Prairie Agricultural Machinery Institute
RRC – Red River College
TAC – Tone Ag Consulting
U of G – University of Guelph
U of M – University of Manitoba

The Quest to Maximize Soybean Yield and Profitability in Manitoba!

ULTIMATE SOYBEAN CHALLENGE

What is it? Three teams have been tasked with selecting their own unique combination of soybean management practices and crop inputs in the quest to be crowned the winner of the Ultimate Soybean Challenge (USC)! The winner will be determined in two categories: yield and profit. The goal is for each team to take on a unique strategy for crop management, representing different approaches that farmers take in crop production.

Where and how? The USC will be located again at the Agriculture and Agri-Food Canada (AAFC) site in Portage la Prairie, MB. Each selected management strategy will be tested in replicated, randomized field trials. Soil characteristics, tillage prior to seeding, rolling, seeding date and harvest date will be the same across all treatments. All other management practices will be determined by the team leaders. Updates on crop progress and management will be provided throughout the growing season. Stay tuned to @MbPulseGrowers on Twitter!

Field Description An 11-acre parcel of land previously seeded to tillage radish will be divided among the three soybean management strategies. The soil is an imperfectly drained Neuhorst clay loam with a pH of 8.4 and 6.9% organic matter. Soil test results include 33 lb/ac of nitrate-N (0–24 inches), 13 ppm of Olsen P, and 414 ppm of K. Soybeans have been grown only once in this field's history.

Meet the Teams and Their Strategies

TEAM A **Cassandra Tkachuk,** MPSG Production Specialist and **Kristen MacMillan Podolsky**, U of M Research Agronomist

Strategy – Follow best management practices, to maximize both yield and net return.

TEAM B **Terry Buss**, Manitoba Agriculture Farm Production Extension Specialist – Pulses, and **Dennis Lange**, Manitoba Agriculture Industry Development Specialist – Pulses

Strategy – Maximize yield and net return by reducing the cost of seed, but spending more on small ticket items.

TEAM C **Curtis Cavers**, Agriculture and Agri-Food Canada Agronomist, and **John Heard**, Manitoba Agriculture Farm Production Extension – Crop Nutrition

Strategy – Choose novel practices to ensure differences in production are observed and alleviate concerns of a "home field advantage."

Strategies

	TEAM A	TEAM B	TEAM C
Variety selected	Akras R2	S007-Y4	OAC Prudence
Inoculant(s)	Liquid + granular	Liquid	Granular
Seed treatment	None	CruiserMaxx Vibrance + Heads Up Plant Protectant (fungicide + insecticide)	Evergol Energy (fungicide only)
Seeding equipment	Air seeder 9" spacing	Planter 30" spacing	Twin-row planter
Seeding rate (seeds/ac)	190,000	150,000	150,000
Anticipated weed control	Pre-emergent residual herbicide (if needed) + 1 glyphosate pass	3 glyphosate passes	Rotary hoe + inter-row cultivation, in-crop herbicide if escapes unacceptable
Fungicide	None	Yes	None
Foliar nutrients	None	Depending on tissue test	Depending on tissue test

On-Farm Network Evaluation of Foliar Fungicide Response in Dry Beans

ON-FARM FOLIAR FUNGICIDE PRODUCT COMPARISON IN PINTO BEANS

White mould is a consistent, problematic disease of dry beans that often limits yield and quality. Manitoba Pulse & Soybean Growers (MPSG) On-Farm Network research collaborator, Brent VanKoughnet of Agri-Skills Inc., conducted on-farm fungicide trials from 2013 to 2016 to assess the seed yield response of pinto beans to various common fungicide products in central Manitoba.

In 2016, Windbreaker certified pinto beans were planted on 30-inch rows at 80,000 seeds per acre on May 24 at Carman, Manitoba. A base fertilizer application of 50 lbs N and 50 lbs P was applied to all treatments, and weeds were controlled using Edge, Viper and Basagran Forte. Fungicide treatments were applied July 15, at reproductive stage R2 (early pin bean). Rainfall for the growing season was above average, with many sporadic and high rainfall events. The growing season started off dry in May, but quickly turned wet as most of the rainfall in May occurred during the last week of the month, and continued into June (Table 1). High moisture and warm weather provided favourable conditions for disease pressure in locations where full canopy closure was observed.

Average seed yield across all treatments was 2,589 lbs/ac in 2016, 835 lbs higher than the provincial average for Windbreaker pinto beans (1,754 lbs/ac). There was no statistical yield advantage using a single application of any fungicide product compared to an untreated check in 2016 at Carman (Figure 1).

A statistically significant yield response to fungicide occurred two out of the past four years (2013 and 2015) at Carman (Figure 1). When fungicide treatments yielded statistically higher than the untreated check, the response was almost always economical as well (i.e., the fungicide paid for itself). There is a wide range in suggested retail price (SRPs) between fungicide products ranging from $18 to $45 per acre. Assuming an application cost of $7/acre, and pinto bean price of $0.30/lb, the break-even yield response needed to cover the cost of fungicide application can range from 83 lbs/ac to 175 lbs/ac for a single application of fungicide.

Table 1. 2016 growing season weather summary – Carman, MB

Month	Rainfall (mm)	Normal (mm)	Heat (GDD)	Normal (GDD)
May	108	68	271	183
June	95	96	364	338
July	79	79	446	442
Aug	58	75	415	427
Total	**340**	**318**	**1496**	**1390**

ON-FARM DRY BEAN FOLIAR FUNGICIDE RESPONSE TRIALS

In 2016, the On-Farm Network expanded to farmer collaborators who compared a foliar application of Lance fungicide to an untreated check in their dry beans. Lance was tested on pinto and navy bean fields at farms in the R.M. of Thompson and the R.M. of North Norfolk. Though there was no significant yield response to Lance at either trial location, fungicide did significantly reduce the white mould disease incidence in pinto beans (25% in untreated vs. 15% in treated). To see full site reports for individual On-Farm Network trial results, visit *manitobapulse.ca/on-farm-network*. Fungicide response trials in pinto and navy beans will continue through the On-Farm Network in 2017.

RECOMMENDATIONS

Though dry beans were unresponsive to foliar fungicide in 2014 and 2016, fungicides are generally applied prophylactically because the return on investment can be dramatic in years with high disease pressure. To determine if fungicide is required to protect dry beans against white mould, MPSG recommends utilizing the *Fungicide Decision Worksheet for Managing White Mould in Dry Bean*, available on *manitobapulse.ca* as a decision support tool. Conducting your own on-farm tests can also provide you with some assurance in your decision. ■

▼ *Figure 1. Yield response to fungicide products in pinto foliar fungicide trial in 2013–2016*

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Soybeans – Good for Lowering Greenhouse Gas Emissions

Dr. Mario Tenuta, Department of Soil Science, University of Manitoba

TO BORROW A line from a famous song in the 1970s, *We've Only Just Begun* to discuss agriculture's role in greenhouse gas reductions and adapting to climate change. Regardless of where you stand on the issues, there will be more public, political and economic attention in the future. A lot has been stated in the media and at grower meetings about the research we've done at the University of Manitoba in 4R nitrogen management to lower nitrous oxide emissions from soil. However, often overlooked is the most important thing farmers can do to lower nitrogen losses and emissions of nitrous oxide – the decision of what crop to grow.

Firstly, what is nitrous oxide? It is more than just the gas that makes canned whipped cream so light and fluffy. Nitrous oxide, or N_2O, is a gas produced mainly by bacteria in soil when they convert nitrogen in organic matter, animal manures, green manures, crop residues, and ammonia/ammonium/urea synthetic fertilizers to nitrate (the plant-available form). Yes, basically any source of nitrogen converted to nitrate results in nitrous oxide. The nitrification process is involved in the nitrous oxide production. To a lesser extent, another nitrogen transformation process caused by soil bacteria, denitrification, produces nitrous oxide when soil is wet and warm. So what? From an agronomic view, nitrous oxide emissions amount to a small loss of nitrogen, about 1–3 lbs N/acre in a year. Where the emissions are lost via denitrification, like during spring thaw and when soil is saturated or flooded, nitrous oxide loss is indicative of much greater loss of nitrogen as nitrogen gas (N_2). We don't have confident numbers on that loss but indirect estimates based on unaccounted for nitrogen in soil indicate 5–80 lbs/ac and perhaps more could be lost, the higher amounts under saturated wet conditions. The concern for nitrous oxide emissions from soil is more about its effect on the environment. Nitrous oxide is a greenhouse gas that per molecule, is about 300 times more potent than carbon dioxide in warming the atmosphere. Now, we produce much more carbon dioxide globally, primarily from using fossil fuels, but nitrous oxide emissions from soil are about 2–5% of our national emissions of all greenhouse gases in Canada. That's a small but important amount because agriculture is the main emitter of nitrous oxide.

With support from soybean farmers in Manitoba through MPSG, we have examined nitrous oxide emissions from soybean. In particular, we have looked at emissions during the growing season, during spring thaw and from soybean residues in the following crop. In brief, we've found emissions are extremely low during the growing season, at time of spring thaw and from soybean residues the following year. Emissions were similar to spring wheat grown with no nitrogen addition. That is amazing considering a 40 bu/acre soybean crop produces (through nitrogen fixation) 120–150 lbs N/acre. That amount of anhydrous ammonia or urea applied to soil can emit 0.6–3 lbs N/acre of nitrous oxide; the lower amount in a dry year and the higher amount in a wet year. Soybean is a wondrous crop, providing for much of its nitrogen and not resulting in nitrous oxide emissions. That's because most of the nitrogen it produces ends up in the oilseed. Can

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VARIETY RELEASE PROGRAM – 2017 UPDATE

The Variety Release Program (VRP) is a seed distribution program managed by Saskatchewan Pulse Growers (SPG) where Select Seed Growers can access breeder seed of new varieties developed by plant breeders at the Crop Development Centre (CDC) at the University of Saskatchewan.

The program's purpose is to facilitate rapid uptake and acceptance of new and improved pulse varieties. Any nationally recognized Select Seed Grower whose provincial pulse grower organization has an agreement with SPG is eligible to apply for breeder seed through this program. MPSG subscribed to the VRP 2017.

Manitoba Select Seed Growers who are members in good standing with MPSG have the opportunity to purchase Breeder pea (yellow, green, maple, forage) and faba bean seed from CDC.

In 2017, Manitoba seed growers requested and have been allocated seed for yellow peas (CDC Amarillo, CDC Inca, and CDC Spectrum) and forage peas (CDC Jasper).

To ensure that new pulse varieties are made available to commercial producers quickly and at a reasonable cost, the VRP provides Breeder seed with no royalty collection requirements; however, all growers contribute to the development of new varieties with check-off collected through MPSG. Manitoba seed growers who request a refund of their check-off submitted to MPSG are unable to participate in the VRP.

For more information, contact Laryssa Stevenson (MPSG) at laryssa@manitobapulse.ca or 204.751.0019

Saskatchewan Pulse Growers

University of Saskatchewan Crop Development Centre College of Agriculture and Bioresources agbio.usask.ca

Manitoba Pulse Soybean Growers

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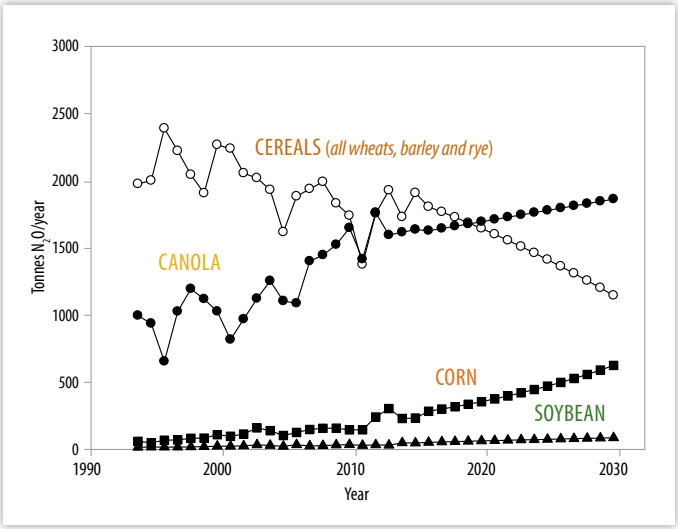
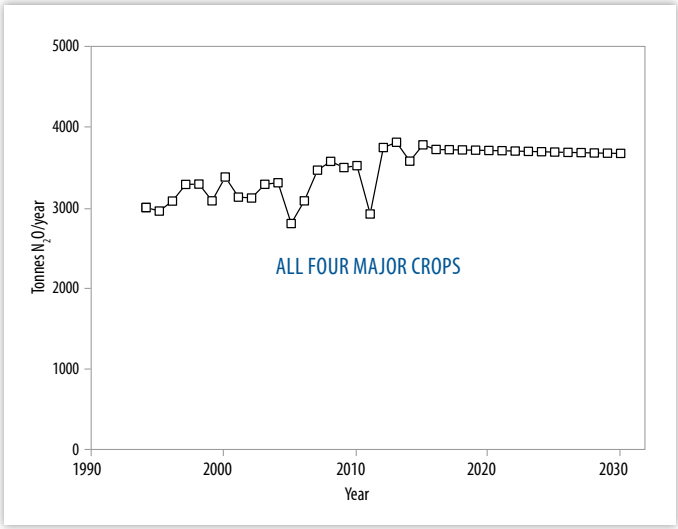
HISTORICAL (1995–2015) AND PREDICTED (2016–2030) NITROUS OXIDE EMISSIONS

▼ *Figure 1. Individual crops in Manitoba.*



▼ *Figure 2. Across all four major field crops in Manitoba.*



soybean and its expanding acreage in Manitoba play a role in reducing nitrous oxide emissions from soil? Can soybean help achieve emission reduction targets?

To address these questions, I've done some back-of-the-envelope calculations estimating nitrous oxide emissions from the four major field crops in Manitoba (cereals, canola, soybean and corn) using some rudimentary assumptions. Taking past crop insurance acreage data for those crops, I projected to 2030 lower cereal acreage because of more soybean with canola being stable since 2006 and moving forward. Also from the crop insurance database, we have been using higher field rates of nitrogen on cereals, canola and corn, about 1.1–1.5 lbs N/acre/year, depending on the crop. Lastly, taking the value for nitrous oxide emission per amount fertilizer added in Manitoba used by Agriculture and Agri-Food Canada and Environment Canada (0.008 kg N_2O–N/kg N fertilizer added), the historical and my predicted crop acreages and nitrogen use moving forward, nitrous oxide emissions from the four major field crops to 2030 were estimated (see Figure 1).

Figure 1 shows how nitrous oxide emissions from cereals are predicted to decline because of lower acreage despite higher nitrogen field application rates. Increased emissions for canola in Manitoba is predicted because of greater rates of nitrogen addition for individual fields despite lack of increase in total acres planted. The increase in emissions from corn is due to both greater field application rates and more planting of the crop. It is important to note the emission scenarios are a "business as usual" prediction of emissions that do not take into account better nitrogen use practices such as using more 4Rs of right source, rate, timing and placement to lower nitrous oxide emissions. Readers may know I'm fervent believer based on research that huge reductions in emissions by using advanced 4R practices are achievable. However, the striking result of the prediction exercise is the pretty much lack of emissions from soybean despite an estimated 3.4 million acres by 2030! There are some emissions because of the nitrogen added with MAP for phosphorus nutrition. The impact of little soybean emissions is that since 2012, nitrous oxide emissions have flatlined and under a "business as usual" (i.e., no greater adoption of 4Rs), emissions will remain the same to 2030 (Figure 2). Wow! What an advantage Manitoba has over other areas, since our nitrous oxide emissions will likely remain unchanged all thanks to growing more soybeans. Thus, it is a real possibility that through continued increase in soybean acreage and greater 4R adoption for nitrogen use of cereals, canola and corn, Manitoba has a real chance of reducing emissions from major field crops by 30% of 2005 levels. That's a discussion to continue. ■

An Innovative Technology for Early Detection of Foliar Soybean Diseases in Manitoba

Dr. Bryan Cassone, Assistant Professor and Gustavo Díaz Cruz, MSc Student, Brandon University

EACH YEAR SOYBEAN fields across Manitoba are bombarded by microscopic organisms that cause diseases to plants. If the environmental conditions are just right, some of these tiny "pathogens" can cause substantial yield losses to infected fields and can even impact entire growing regions. Based on the 2016 season, soybean production in Manitoba is still going strong. A major contributor to farmers' success so far is because many of the economically important pathogens found in more established soybean regions of North America have not yet made it to the province. While this is certainly good news, the threat of their emergence looms.

EARLY DIAGNOSTICS IS KEY

Soybean disease management relies heavily on integrative strategies, which includes seed treatment, crop rotation, planting resistant varieties, and foliar fungicide. In most cases these control measures are tailored to specific diseases and can vary considerably depending on the types of pathogens infecting our fields. In fact, a lack of this knowledge is the number one reason why many serious disease outbreaks occur. By placing an emphasis on the early detection of emerging pathogens, appropriate management practices can be put into place to minimize the spread or severity of these pathogens and ensure a profitable industry for years to come.

A NEW WAY TO DIAGNOSE DISEASE

Despite major technological advances steadily increasing crop yields, our ability to accurately and sensitively diagnose soybean disease remains spotty at best. For instance, most disease surveys rely on visual inspection of symptom development. While quick, easy, and cost effective, this often leads to an incorrect diagnosis or inaccuracies among surveyors. Laboratory culturing of the pathogen is another common approach but this also suffers from unreliability. More recently, surveillance has used serological or nucleic acid based methods. While sensitive and accurate, both approaches only validate existing diseases, and are therefore impractical for detecting emerging pathogens. Without getting too technical, our novel diagnostic approach overcomes these obstacles by harnessing a relatively new technology called "next-generation sequencing." First, we pluck a single leaf from a diseased plant, preserve it in a special solvent, and take it back to the lab to be fully sequenced. This teases out DNA (the genetic code) from any kind of disease that the soybean plant could be harbouring. We then go through multiple stages of "DNA work" before we generate the data – literally billions of pieces of DNA from the plant and the pathogens. These are pieced together for each plant just like a giant DNA puzzle. The result is an accurate and comprehensive catalogue of all the surveyed pathogens – including reliable identification of some that have never before been detected in Manitoba.

WHY FOCUS ON FOLIAR DISEASES?

A 2010 study (Wrather et al., Plant Health Progress) compiled estimates of soybean yield losses due to diseases in the top eight soybean producing countries. Their data showed over half of the losses are attributed to foliar diseases. Currently in Manitoba, the most commonly diagnosed soybean diseases are foliar. Given their economic importance and predominance in the province, we have initially targeted foliar diseases but the technology could be applied to both root and stem diseases diagnostics down the road.

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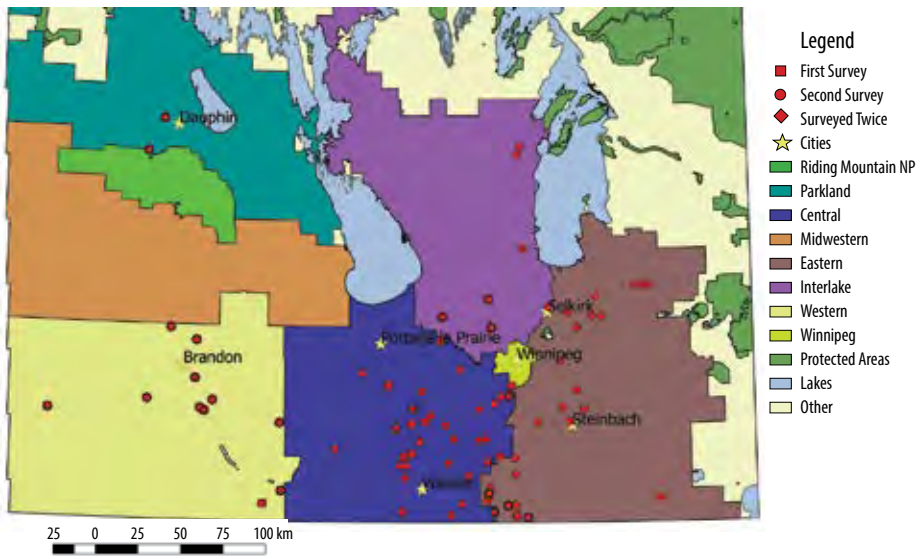
Figure 1. Regional distribution of soybean fields surveyed in Manitoba in 2016. The first survey denotes the V2/3 stage; the second survey denotes the V6 stage. Diseased leaves were sampled from six regions in total.



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THE 2016 SURVEY

Our surveillance efforts were a collaboration between Brandon University, Manitoba Pulse & Soybean Growers and Manitoba Agriculture. A total of 81 fields throughout the Manitoba soybean growing regions were surveyed in late June (V2/V3) and/or in late August (V6) (Figure 1). In each field, samples were collected from any plant exhibiting different foliar symptoms, resulting in nearly 700 leaf collections.

THE USUAL SUSPECTS

Our survey uncovered a myriad of foliar disease-causing pathogens, found in all regions surveyed (Table 1). As expected, we identified several pathogens of common soybean diseases – *Septoria* brown spot, anthracnose, bacterial blight, leaf spots, downy mildew, and *Cercospora* blight. Most of these were distributed throughout the growing region, and have varying degrees of economic impact. Brown spot and anthracnose usually account for the greatest yield losses in North America but this is largely dependent on region and seasonal conditions.

FROGEYE AND BACTERIAL PUSTULE

Our survey identified disease-causing pathogens that have not yet been reported in Manitoba soybean. This includes widespread incidence of two *Xanthomonas* species that cause soybean bacterial pustule. Disease symptoms are similar to those of bacterial blight but lesions do not appear water-soaked and will have raised centres. Our most important diagnosis is the fungal pathogen *Cercospora sojina*, which causes frogeye leaf spot of soybeans. Initial leaf symptoms appear about two weeks after infection as small, circular to somewhat irregular spots on the upper surface of the leaf. Initial dark, water-soaked spots develop into lesions with dark brown centres surrounded by red/yellow or dark reddish-brown margins (Figure 2). Both pathogens are most damaging in hot and wet conditions, and can result in significant yield losses on susceptible soybean varieties. The prevalence of both diseases suggests their respective pathogens were present in Manitoba in previous years but went unreported.

▼ *Figure 2. Soybean leaves collected in the western region of Manitoba, later confirmed to be infected with Frogeye leaf spot.*

NEW VIRAL DISEASES

While Manitoba soybean has enjoyed relative freedom from viral diseases, they do pose serious problems in other

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Table 1. Foliar pathogens identified during the 2016 disease survey in Manitoba, including the number of fields the respective pathogen was identified in.

Type	Pathogen	Disease	Number of Fields
Fungi	*Alternaria alternata*	Leaf spot	6
	Alternaria tenuissima	Leaf and stem spot	5
	Cercospora kikuchii	Leaf blight	3
	Cercospora sojina	Frogeye of soybean	4
	Colletotrichum spp.	Anthracnose	4
	Phoma spp.	Leaf spot in several crops	5
	Septoria glycines	Brown spot	5
Bacteria	*Pseudomonas syringae*	Bacterial blight	6
	Xanthomonas axonopodis	Bacterial pustule	4
	Xanthomonas campestris	Bacterial pustule	5
Virus	*Bean yellow mosaic virus*	Virus infecting several legumes	1
	Tobacco necrosis virus	Bean stipple streak virus	4
Oomycete	*Peronospora manshurica*	Downy mildew	5

What on earth to do about these compacted fields?

Marla Riekman, MSc, PAg, CCA, Soil Management Specialist, Manitoba Agriculture

FOLLOWING ANOTHER WET fall, farmers are again worried about the impact of ruts and soil compaction on the upcoming crop. Soil compaction can be tricky to diagnose – penetrometer readings can tell you if a soil is tight or may resist root growth, but these readings are not always well correlated with crop yield. Generally, it's the crop itself which indicates compaction. Stunted crop height and nitrogen deficiency can all be indicators of a compaction problem. Watch for wheel traffic patterns in the field and inspect crop roots in the suspect areas for kinky growth patterns (sideways and not down) and poor nodulation (Figure 1).

The effect of compaction on yield may be very inconsistent as there is such high variability in traffic patterns, equipment weight and soil moisture conditions, which lead to inconsistent effects of compaction across a field. This makes research on yield loss due to compaction very difficult to manage. Timely rains and wet weather following compaction will decrease the impact on yield, virtually erasing the compaction that was purposefully caused by researchers. As such, field research may show impacts on crop emergence and root depth, but often there is little effect on yield or simply no yield data taken.

While scientific data on yield is limited, there is anecdotal evidence showing lower yields in soybeans due to extensive wheel traffic. One farmer in Minnesota noted an area of the field where he had cleared out a windbreak, causing heavy compaction, and the soybeans were less than half the height of the rest of the field (Figure 2). This resulted in a 13.7 bu/ac decrease in soybean yields between no traffic (59.1 bu/ac) and wheel traffic (45.4 bu/ac) strips in his field. The yield loss was not that high considering the dramatic differences in plant height. This demonstrates the soybean's ability to compensate for compacted soil conditions; however, this is just anecdotal data – research would be required to confirm if this yield impact is typical. Dry beans, on the other hand, may suffer more under compacted soil conditions. Research has shown a 27% yield reduction due to soil compaction, primarily due to greater susceptibility to disease pressure and smaller canopies that experience more damage from hail events.

▼ *Figure 1. Poor root growth observed in soybean (right) on compacted heavy clay soil.*

Photo credit: Laryssa Stevenson

So if soil compaction will affect yields, then what can one do about it? The first option is to just sit back and wait. Mother Nature does help to alleviate compaction, but she needs to create drying conditions for this to work. Freeze-thaw helps to break up compaction at the soil surface, but deeper compaction is affected by wet-dry changes, where cracks are formed deep into the soil profile. We haven't seen a dry fall for a few years, which means compaction hasn't been naturally alleviated, and rather seems to be increasing due to continued travel on wet or moist soils.

A second option may be to help speed up the drying process by planting a cover crop. Cover crops will help use up some of the excess moisture in fall, drying out the soil to move towards that "cracking" scenario. Cover crops also create root channels or "bio-pores," which may be exploited by future crop roots to move deeper into the soil profile for water and nutrients, where the compacted layer may have otherwise restricted them.

A third option may be to consider deep tillage or sub-soiling to alleviate compaction. However, keep in mind

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North American growing regions. Our survey uncovered two previously unreported but relatively common soybean viruses: *bean yellow mosaic virus* and *tobacco necrosis virus*. The good news is neither virus is considered to be economically impactful. Their presence in the province, however, suggests we should be on the lookout for other common soybean viruses that could cause appreciable damage, such as *soybean mosaic virus*, *bean pod mottle virus*, and *tobacco ringspot virus*.

WHAT'S NEXT

Our second survey will be carried out during the 2017 growing season. We will monitor the incidence and distribution of diseases already known to be in the province, as well as screen for the pathogens of any destructive emerging diseases that could arrive this year (e.g., Sudden Death Syndrome). We will also add sampling protocols to survey stem diseases. If there are new and potentially harmful diseases out there this year, we will continue to do our very best to track them down. ■

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▼ *Figure 2. Observed plant height difference due to compaction, leading to a 13.7 bu/ac difference in yield.*

that to effectively sub-soil, the soil needs to be very dry so that cracking and shattering between the shanks can take place. If the soil is still moist at depth, sub-soiling may just create further compaction deep in the soil, which may not be fixed with tillage later on. The benefits of sub-soiling may also not last for long – research in the Red River Valley has shown that, while sub-soiling did improve soil resistance (lower penetrometer readings), by the third year after sub-soiling, soil resistance was back to where it had been before sub-soiling. This means that sub-soiling may need to be added into a tillage rotation, if it is to be used at all. And, as this is an expensive form of tillage, you would need to see a significant yield improvement to offset the cost.

The final option, and one that may be the most difficult for farmers, is to simply not cause as much compaction in the first place. Choosing not to travel on a field when it is moist (and at the highest risk of compaction) is simply not an option when field operations need to be completed. However, one can try to minimize the impact of compaction by running tires at their rated pressure (spreading out the wheel footprint by lowering pressure and choosing wider diameter tires), decreasing the load or weight of equipment, and limiting random traffic across the field. When risk of compaction is high, we need to be deliberate about how we travel on the field, so we don't further complicate the problem. ■

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Growing Soybean After Corn in Manitoba?

On-Farm trials confirm that you have options for residue management on sandy soils

Patrick Walther, MSc Student with Dr. Yvonne Lawley, Department of Plant Science, University of Manitoba

CORN LEAVES A lot of residue to manage after harvest. A recent on-farm study conducted at the University of Manitoba looked at how soybeans handled contrasting strategies for corn residue management. Field trials were conducted over a three-year period (2014–2016) and set up as randomized and replicated on-farm trials in four locations in Manitoba on sandy soils (MacGregor 2015, Winkler 2015, Haywood 2016 and MacGregor 2016). Four tillage practices were compared: 1) conventional double disc; 2) vertical till high disturbance; 3) vertical till low disturbance; 4) strip till. Residue management treatments occurred in the spring with the exception of the Winkler site where treatments occurred in the fall.

Detailed measurements were taken through this study to quantify seedbed conditions and soybean crop performance after the residue management treatments. Soil temperature and moisture were recorded hourly at 5 and 30 cm throughout the study. Soybean emergence, flowering, and maturity were observed three times a week during these critical growth stages. Soybean were harvested using commercial combines and calibrated weigh wagons. An additional experiment was conducted with the Prairie Agricultural Machinery Institute (PAMI) in the fall of 2015 to measure and compare fuel consumption and horsepower requirements for the tillage equipment included in the study.

DID CORN RESIDUE MANAGEMENT INFLUENCE SEEDBED CONDITIONS FOR THE SOYBEAN?

Around the time of planting, daily soil temperatures at 5 cm varied among treatments only during the daily high and low periods of the day. Overall, all treatments with tillage grouped together in contrast with the undisturbed soil that was monitored between tilled rows in the strip till treatment (Figure 1). Soil temperature trends were not always consistent between site years. Planting and rolling operations seemed to have reduced differences between treatment for daily maximum and minimal soil temperature patterns (Figure 1).

Another way to look at the effect of residue cover on soil temperature throughout the soybean emergence period is to calculate cumulative soil temperature above the threshold temperature of 10°C that is critical for rapid soybean emergence. During soybean emergence, soil temperature at planting depth (5 cm) showed no differences among treatments in total accumulated as well as daily accumulated soil temperature above 10°C at any site year.

Previous studies have shown that residue cover can also influence soil moisture at planting, which would be of interest for soybean emergence. However, in this study only two out of four site years had higher moisture contents over a longer period of time in the untilled part of strip till. At planting, all treatments at all sites had the minimal volumetric soil moisture threshold of 0.096 m^3 m^{-3} required for soybean emergence. Therefore no differences in soil moisture could be observed in the seed row where the seed was planted.

HOW WELL DID SOYBEAN EMERGE?

Despite differences in absolute soil temperature between residue management treatments, no significant differences in soybean emergence and final plant stand were observed in three out of four site years (Figure 2–6). This indicated that no matter what tillage treatment was used, emergence was the same among treatments and showed that soybean are not influenced by different tillage treatments on sandy soils. Later in the growing season, soybean flowering revealed differences between treatments but these differences only occurred in two out of four site years. In 2015, the vertical till low disturbance treatment in MacGregor (2016) and the double

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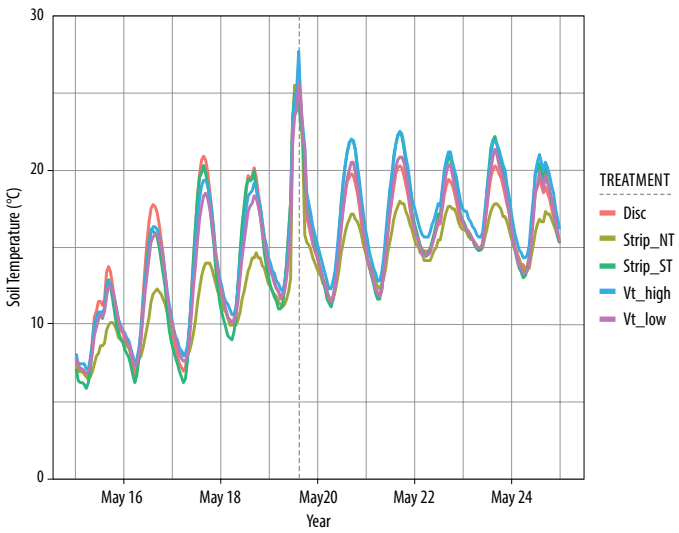
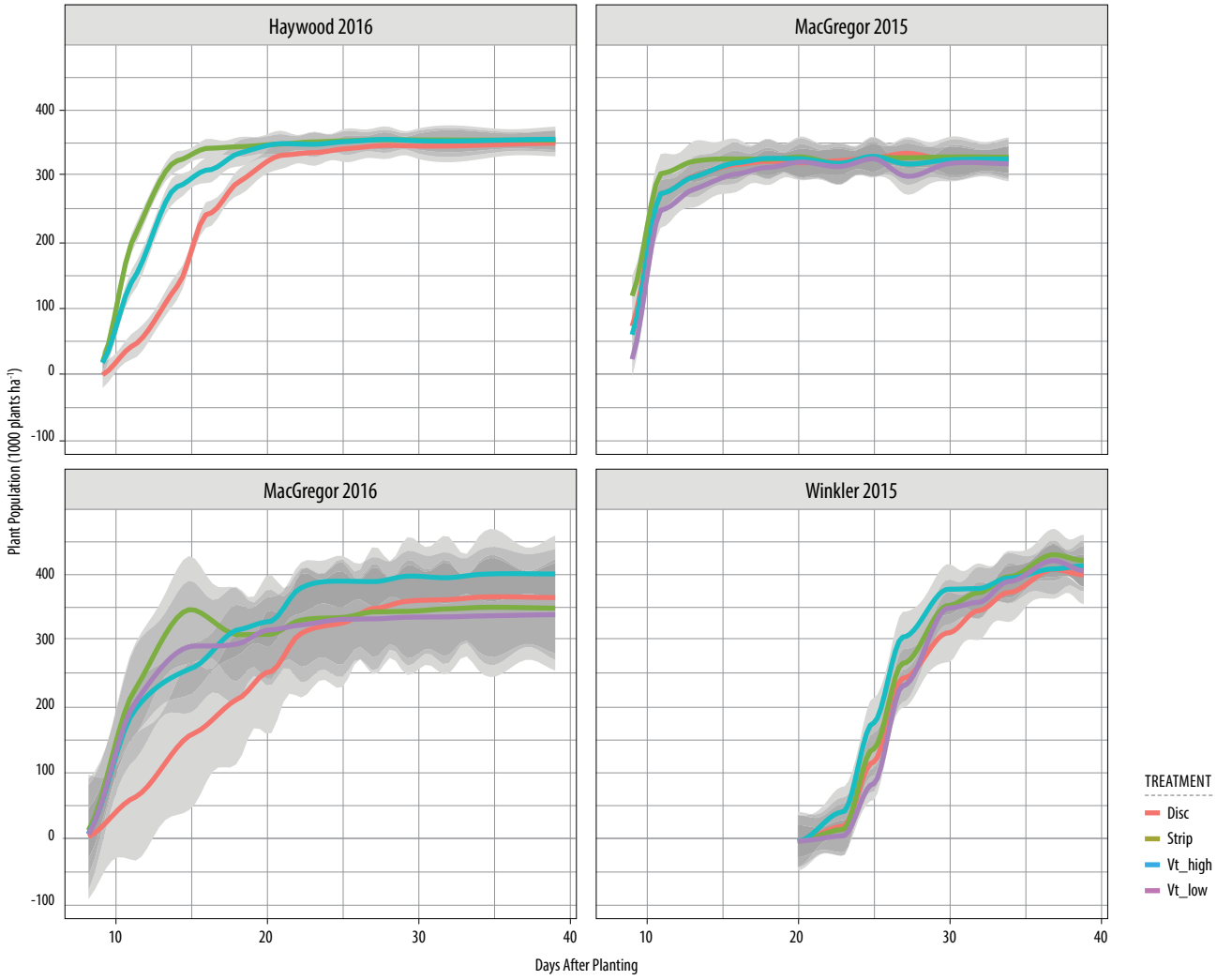
▼ *Figure 1. Soil temperature at 5 cm depth in MacGregor 2016 before and after planting (May 19th 2016, see dotted line) for corn residue management treatments: double disc (Disc), strip till between row (Strip_NT), strip till in row (Strip_ST), vertical till high disturbance (Vt_high) and vertical till low disturbance (Vt_low).*



▼ *Figure 2. Soybean emergence and final plant stand following corn residue management treatments using double disc (Disc), strip till (Strip), vertical till high disturbance (Vt_high) and vertical till low disturbance (Vt_low) in Haywood 2016, MacGregor 2016, MacGregor 2015 and Winkler 2015.*



disc treatment in Haywood showed a significantly lower percentage of plants that flowered on a given day. Why these soybeans responded to the residue management treatments in these site years is unclear. Aerial imagery in 2016 showed no significant differences in Normalized Difference Red Edge Index (NDRE) among treatments in Haywood and MacGregor. NDRE is used as a more accurate alternative to Normalized Difference Vegetation Index (NDVI) when canopy is closed. Soybean maturity ratings showed in three out of four site years no significant differences among treatments and therefore strengthens the aerial observation of NDRE at pod filling.

WAS THERE A YIELD DIFFERENCE?

Averaged across all site years, soybean grain yield was not statistically different among the corn residue management treatments. The findings from this study agree with similar studies conducted in Minnesota that contrasting corn residue management treatments have no influence on soybean yield (DeJong-Hughes, 2011; Nowatzki et al., 2011). However, differences in plant growth characteristics were found. Plant height and pod height varied significantly among tillage treatments. Strip till had the tallest plants, but at the same time, had the lowest pods. Although pod heights differed statistically, the differences were not agronomically significant (less than 0.35 inches).

THE COST OF TILLAGE

To evaluate the overall profitability of the soybean test crop an economic analysis was conducted. For the analysis, costs due to management practices such as seeding rate and crop protection were kept the same among treatments. Revenue calculated from soybean yields were also the same due to a lack of statistical differences between treatments in the experiments. Thus, the differences in economic return are driven by the cost of tillage systems that were compared. Costs associated

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with the tillage systems included fuel, equipment and labour. Total costs for corn residue management treatments were: double disc ($32.25/ac, including two passes), vertical till high disturbance ($31.7/ac, including two passes), vertical till low disturbance ($29.72/ac, including two passes) and strip till ($19.31/ac, only one pass required). Using the average farm size for Manitoba of 1,134 acres, strip till could save the farmer $11,805 compared to vertical till and $14,674 compared to double disc per year. Furthermore, strip till as a one-pass system practiced across an average farm of 1,134 acres, showed time savings of 1.1 to 3.7 days compared to vertical till and double disc, respectively.

WHAT DID WE LEARN FROM THIS PROJECT?

This research project has provided information that was not previously available to help soybean growers in Manitoba evaluate residue management practices in side-by-side replicated field scale experiments to see the impact on soybean. The main take-home messages are:

- Soil temperatures were not lower with reduced tillage implements (vertical till and strip till) compared to standard double disc
- No-till would likely result in lower soil temperatures at seeding compared to standard tillage practices
- Reduced tillage treatments (vertical till and strip till) had the same soybean yields as the standard double disc treatment in sandy soils
- All experiments were conducted on sandy soils. Further investigations are needed to evaluate these corn residue management strategies on poorly drained and heavy clay soils
- Using a one-pass system for corn residue management, such as strip till, on an averaged size farm in Manitoba could save a farmer up to 3.7 days of work and $14,679 in tillage costs per year compared to standard double disc
- There is value to on-farm research. Participating in on-farm research allows you to find out what works on your farm and gives researchers the chance to learn from your expertise.

▲ *Figure 3. Soybean emergence in the conventional tillage corn residue management treatment with a double disc in MacGregor 2016. The double disc had two sets of concave discs following after each other to assure a good mixture of residue into the soil. Surface residue coverage after two passes was 30%.*

▲ *Figure 4. Soybean emergence in the vertical till high disturbance corn residue management treatment in MacGregor 2016 (6° disc angle, concave disc). The angle of the vertical till unit disc creates much more soil disturbance than in vertical till low disturbance. Surface residue coverage after two passes was 27%.*

▲ *Figure 5. Soybean emergence in the vertical till low disturbance corn residue management treatment in MacGregor 2016 (0° disc angle). Surface residue coverage after two passes was 65%.*

▲ *Figure 6. Soybean emergence in the strip till corn residue management treatment in MacGregor 2016. Strip till uses tillage in only a small strip zone and leaves the area in-between the shanks undisturbed. Surface residue coverage after two passes was 4% in the strip, 95% between the strips and 63% when analysed over the entire area.*

Photos courtesy of Patrick A. Walther

This project was conducted as part of a larger corn agronomy project at the University of Manitoba that is funded by the Manitoba Corn Growers Association, Western Grains Research Foundation, and *Growing Forward 2*. The generous and collaborative efforts of the farmers that hosted these on-farm trials is gratefully acknowledged. ■

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Be Aware of Market Risks Involved with

CROP PROTECTION PRODUCTS THIS SEASON

Market access is important to the Canadian pulse industry, and growers play a key role in keeping the doors open. More than 85% of Canada's pulse production is exported to feed the world. Pulse growers are advised to be aware of possible marketing restrictions that may arise from using certain crop protection products this season. Growers are encouraged to review all of the following information before proceeding with their pulse crop management plans. Guidelines for specific products are available on the next page of this document.

IMPORTANT INFORMATION FOR PULSE GROWERS

WHAT ARE THE CROP PROTECTION PRODUCTS TO PAY ATTENTION TO THIS SEASON?

For pulse crop production in Western Canada, these products include diquat (Reglone®), glyphosate (Roundup®), saflufenacil (Heat®), glufosinate (MPower® Good Harvest®), flumioxazin (Valtera™), carfentrazone (Aim®, CleanStart®), benzovindiflupyr (Solatenol®, Elatus™), and chlorpyrifos (Lorsban™ and other trade names).

WHAT ARE THE RISKS OF USING THESE PRODUCTS?

There is no need for caution if applied early in the season, but very late applications of fungicides or insecticides may result in residue levels found in the seed. With desiccants and harvest aids there could be more risk with residue on the seed as these products are applied very late in the season. As a result, growers must ensure that they take appropriate risk mitigation steps to assure product residue remains below MRLs set by regulatory agencies.

WHAT DEVELOPMENTS HAVE THERE BEEN ON THESE ISSUES SINCE LAST YEAR?

The Canadian pulse industry is working hard to eliminate market access risks. For the crop protection products referenced in this document, growers are advised to be aware of international regulations in order to make the best crop management decisions.

WHAT CAN YOU DO TO MITIGATE RISK?

Ensure product residues remain at trace levels or levels well below accepted maximums by following these steps:

1. **Do not exceed the product's labelled rate**
   Regulations for individual pesticides are set to allow growers to properly use the product without fear of violating domestic MRLs. However, these guidelines assume that the labelled rate is not exceeded. If you exceed the labelled rate, you risk surpassing recognized MRLs and this can have serious consequences in terms of both domestic pesticide laws, and international acceptance of the crop.

2. **Time the application according to the label**
   Labels are very specific in terms of crop staging. Follow label instructions and apply crop protection products only at the recommended crop stage, so that you do not risk exceeding the maximum residue limits making your crop difficult to market.

3. **Consult with your exporter/processor about which crop protection products are acceptable in international markets**
   Exporters/processors have a good sense of which markets may be sensitive to specific products. They will likely ask you what was used in your crop and possibly for more information.

4. **Consult the chart on the following page indicating market considerations and statuses for specific products or visit www.keepingitclean.ca.**

ALBERTA PULSE GROWERS

SASKATCHEWAN pulse Growers

MANITOBA Pulse Soybean GROWERS

MARKET CONSIDERATIONS FOR USE OF PULSE CROP PROTECTION PRODUCTS - April 2017 Update

Crop Protection Products	Peas	Lentils	Chick-peas	Beans	Faba Beans	Comments
A. Desiccant/Harvest Management Tools						
Glyphosate* *(e.g. Roundup)*	✓	✓	!	!	!	Consult with your exporter/processor before using the product for certain crops/destinations. MRLs are established in key markets, however MRLs are set at low levels for dry beans in the EU and JPN, and all pulse crops in Korea except for lentils.
Diquat *(e.g. Reglone)*	!	!	!	!	!	Consult with your exporter/processor on pulse crops destined for the US. MRLs are established in key markets but are set at low levels in the US.
Saflufenacil *(e.g. Heat)*	✓	✓	✓	✓	NR	MRLs have been established for all major export markets.
Glufosinate *(e.g. MPower Good Harvest)*	!	!	NR	NR	NR	Consult with your exporter/processor before using the product. MRLs are established in the EU and JPN, but not in the US or at CODEX.
Carfentrazone *(e.g. Cleanstart, Aim)*	!	NR	!	!	!	Consult with your exporter/processor before using the product. MRLs are established in the EU, US and JPN, but not at CODEX.
Flumioxazin *(e.g. Valtera)*	✓	!	!	!	!	Consult with your exporter/processor before using the product for certain crops/destinations. MRLs are established in key markets, however MRLs are set at low levels for beans, chickpeas and lentils in the EU.
B. Other Crop Protection Products						
Chlorpyrifos *Insecticide (e.g. Lorsban, other trade names)*	NR	✓/!	NR	NR	NR	If applied according to label rates early in the crop year at vegetative stage or during flowering, there is no need for caution. In cases of later-season application during pod development or seed fill to maturity (e.g. for late season grasshopper control), consult with your exporter/processor.
Benzovindiflupyr *Fungicide (e.g. Elatus, Solatenol)*	✓/!	✓/!	✓/!	✓/!	✓/!	If applied according to label rates and only early in the crop year (e.g. single application at 0-20% flowering), there are no crop export marketing issues. Due to marketing issues in key export markets (Japan, EU and CODEX) do not apply later than 20% flowering.

✓ No marketing issues.

! Know your market. There is at least one market where MRLs are not established. Consult with your exporter/processor.

✓/! No marketing issues associated with early application. If late application during pod development or seed fill to maturity (e.g. for late season grasshopper control), consult with your exporter/processor.

! Do not use after 20% flowering.

NR Not registered. Only use registered product.

* Pre-harvest application of glyphosate is of interest for two reasons: 1. Glyphosate use in general and specifically pre-harvest use is under increased scrutiny by segments of the general public concerned with several components of modern agricultural systems. 2. Unlike many products applied in fall, applying glyphosate when seed moisture content is 30% or above can result in residues greater than the maximum allowable limit.

Optimizing Dry Bean Row Spacing and Seeding Density for Production in Manitoba

Laura Schmidt, MSc Student with Dr. Rob Gulden, Department of Plant Science, University of Manitoba

LAST YEAR, MANITOBA was the largest producer of dry beans in Canada with just over 117,000 acres seeded, accounting for 42% of the national acreage. Currently, our recommendations for dry bean production are based on data from other regions and need to be revisited for newer varieties with divergent growth habits. Since Manitoba accounts for a large proportion of dry bean production, it is important to invest in local research and revisit these recommendations for our shorter growing season environment.

The optimum combination of row width and seeding density has been shown to be a critical requirement for yield maximization. Previous research conducted in North Dakota found a yield increase of up to 57% by reducing row spacing from 30 inches to 7.5 inches in navy beans (Grafton et al 1988) and it would be desirable to see if these yield benefits could translate to our local environment as well. Additionally, these narrow row widths have been shown to increase the crop's competitive ability against weeds due to canopy closure occurring earlier in the season, maximizing light interception and shading out later emerging weeds (Malik et al 1993). The other argument with narrow rows is that aeration is reduced beneath the canopy, creating the ideal microclimate for white mould disease development, and leading to the expression of concerns that this will cause an increased incidence of white mould disease and its associated yield penalty.

▼ *Narrow and wide row pinto beans early August at Portage la Prairie, 2016.*

The goal of this study is to maximize dry bean yield by determining the optimal combination of row spacing and seeding density for cultivars with differing growth habits. This will allow us to revisit existing recommendations for our local conditions and newer varieties.

This study has just finished its second year and was conducted at both Carman and Portage la Prairie, MB. Navy varieties chosen were Envoy (determinate bush-type) and T9905 (upright bush-type) and pinto varieties chosen were Windbreaker and Monterrey (Both upright bush-type). The smaller-seeded navy beans were planted at five target plant populations ranging from 80,000–240,000 plants ac^{-1} and the pinto beans from 40–200,000 plants ac^{-1}. All densities and varieties were tested at four row widths: 7.5, 15, 22.5, and 30 inches.

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MAXIMIZING DRY BEAN YIELD

Unexpectedly, dry bean yield did not increase with increasing plant density for any row spacing or variety (Figure 1). With increasing density, there were no significant yield differences for row widths ranging from 15–30 inches. At the 7.5-inch row widths however, we saw a decreasing trend in yield with increasing plant populations. Since we're not seeing a yield boost with these increasing plant populations there may be the opportunity to save on seed costs here.

On the other hand, row widths are providing another interesting part of the story. The narrow rows of 7.5 inches have out-performed 30-inch rows by about 2000 lbs ac^{-1} across varieties, sites, and densities (Figure 2), which is comparable to research previously conducted in North Dakota (Grafton et al 1988). With the past two years of data, on average, that translates to a 52% yield increase by narrowing rows from 30 to 7.5 inches.

There is earlier canopy closure in the field in the narrower rows, which is good for maximizing light interception and increasing competitive ability (Figure 3). These canopy pictures were taken in early August and there is still bare field in the wider rows that is not being utilized by the crop. This means there is sunlight that is not being used for yield formation which provides an opportunity for weeds to grow. Since the narrower row crops are able to maximize resource capture earlier in the season, they are able to attain this higher yield.

Each plot was assessed for the severity of Sclerotinia disease pressure in both 2015 and 2016. Interestingly, Sclerotinia severity only significantly influenced yield at one site year out of the four, with higher density stands being influenced by the disease pressure more than those with lower plant populations. With the narrow row widths, a corresponding increase in Sclerotinia disease pressure was also seen. However, this disease pressure

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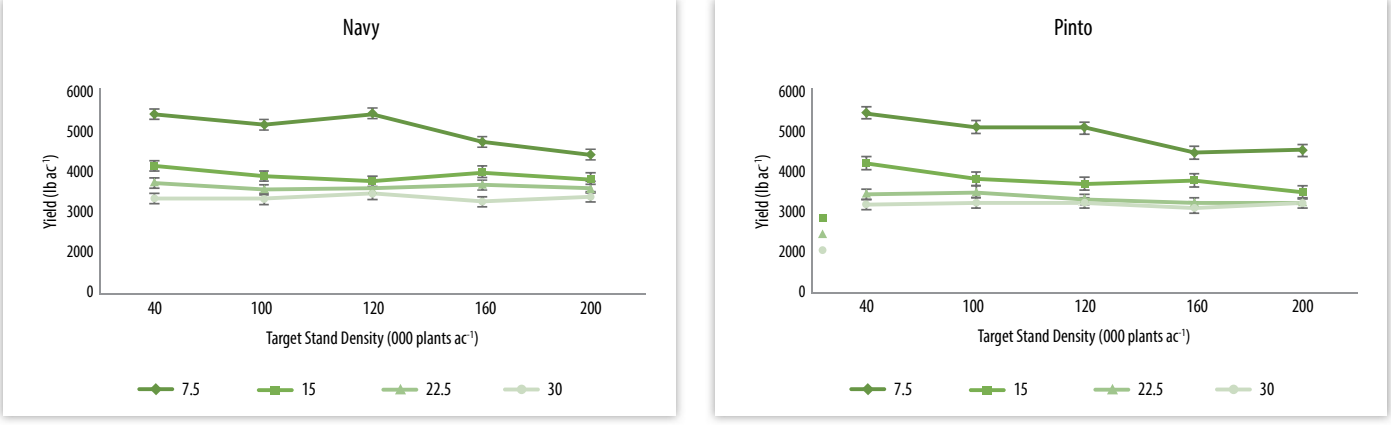
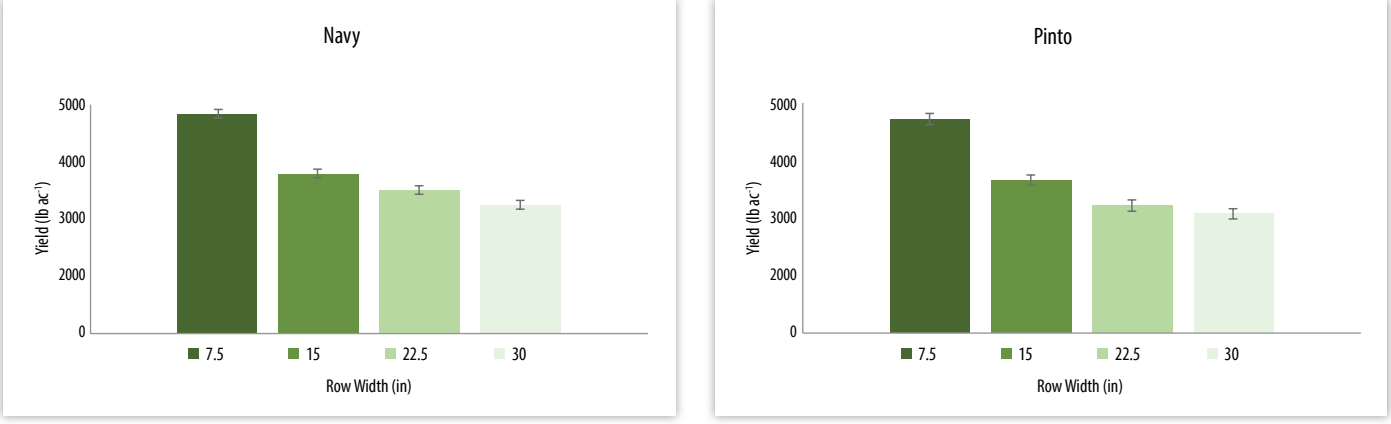
▼ *Figure 1. Dry bean yield (lbs ac^{-1}) for navy and pinto beans with increasing target plant stand density at four row widths (7.5, 15, 22.5, and 30 inches). Variety data has been combined due to similar performance. Data is also combined across all site-years.*



▼ *Figure 2. Dry bean yield (lbs ac^{-1}) for navy and pinto beans with increasing row width (inches). Data is combined across all site-years, seeding densities and varieties.*



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does not appear to be enough to significantly counteract the yield gains these narrower row widths are achieving in the field.

This study is ongoing and will have further replication to verify the results we have seen from the last two years, and will allow us to further determine the optimal combination of row spacing and seeding density for dry bean production in Manitoba.

SUMMARY OF PRELIMINARY RESULTS

- Dry bean varieties tested did not differ in yield
- Increased seeding rates did not increase dry bean yield
- Narrow row widths (7.5 inches) performed best over the past two years of this experiment, increasing dry bean yield by 52% compared to the wide row widths (30 inches)
- Although *Sclerotinia* white mould is a concern with narrow rows, the yield gains exceeded any potential yield loss from increased *Sclerotinia* incidence.
- This research is still ongoing and has additional site years of data to be collected and will also seek to better understand the lack of response in dry bean yield to increasing plant populations. ■

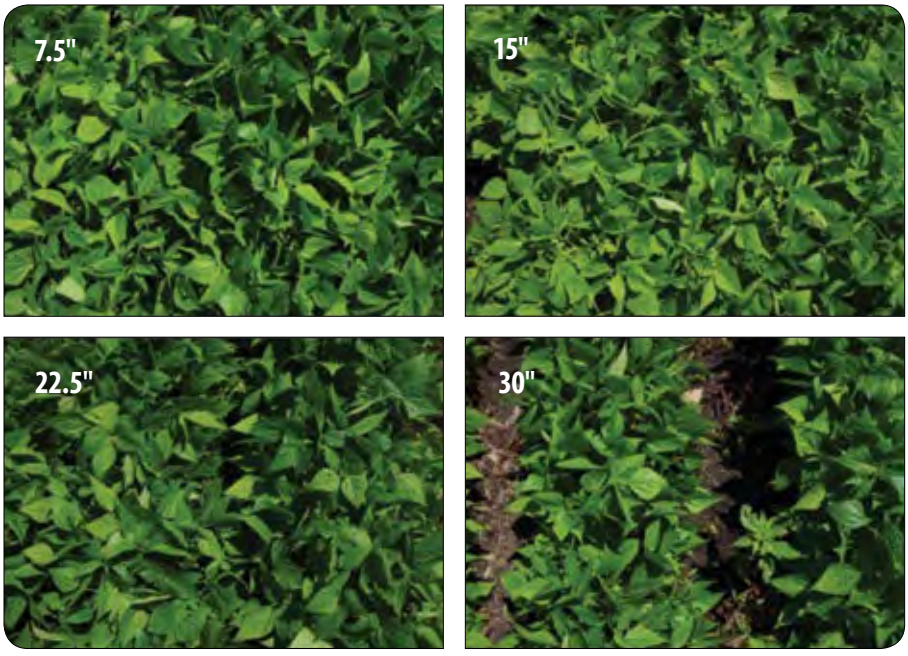

Figure 3. Pinto bean canopy closure images taken for each row width in early August in Portage la Prairie, 2016. Photos are comparing the same seeding density (120,000 plants ac^{-1}).

Manitoba Pulse & Soybean Buyer List – May 2017

COMPANY	EDIBLE BEANS	FABA BEANS	LENTILS	PEAS	SOYBEANS	PHONE	LOCATION	CGC REGULATED
Agassiz Global Trading	✓				✓	204-745-6655	Homewood, MB	
Agri-Tel Grain Ltd.				✓	✓	204-268-1415	Beausejour, MB	✓
AGT Foods	✓		✓	✓	✓	306-525-4490	Regina, SK	✓
• SaskCan Pulse Trading – Parent Division	✓		✓	✓	✓	204-737-2625	St. Joseph, MB	✓
All Commodities			✓	✓		204-339-8001	Winnipeg, MB	✓
B.P. & Sons Grain and Storage Inc.					✓	204-822-4815	Morden, MB	✓
Belle Pulses Ltd.				✓		306-423-5202	Bellevue, SK	✓
Besco Grain Ltd.	✓	✓	✓	✓	✓	204-745-3662	Carman, MB	✓
Best Cooking Pulses Inc.			✓	✓		204-857-4451	Portage la Prairie, MB	✓
Brett-Young Seeds				✓	✓	204-261-7932	Winnipeg, MB	
BroadGrain Commodities Inc.	✓	✓	✓	✓	✓	416-504-0070	Toronto, ON	✓
C.B. Constantini				✓		604-669-1212	Vancouver, BC	✓
Canadian Grain Inc.	✓	✓	✓	✓	✓	905-257-6200	Oakville, ON	✓
Cargill Ltd.				✓	✓	204-947-6219	Winnipeg, MB	✓
Delmar Commodities				✓	✓	204-331-3696	Winkler, MB	✓
Farmer Direct Co-operative Ltd.	✓	✓	✓	✓		306-352-2444	Regina, SK	
Fill-More Seeds Inc.			✓	✓		306-722-3353	Filmore, SK	✓
G3 Canada Limited				✓		204-983-0239	Winnipeg, MB	✓
Gavilon Grain LLC					✓	816-584-2210	Omaha, NB	✓
Global Grain Canada	✓					204-829-3641	Plum Coulee, MB	✓
Hensall District Co-op	✓					204-295-3938	Winnipeg, MB	✓
Horizon Agro					✓	204-746-2026	Morris, MB	
ILTA Grain Inc.	✓	✓	✓	✓	✓	604-597-5060	Surrey, BC	✓
J.K. Milling Canada Ltd.				✓		306-586-6111	Regina, SK	✓
Knight Seeds			✓	✓		204-764-2450	Hamiota, MB	
Kalshea Commodities Inc.				✓		204-272-3773	Winnipeg, MB	✓
Lansing Olam Canada Commodities ULC					✓	877-747-7599	Chatum, ON	✓
Linear Grain	✓			✓	✓	204-745-6747	Carman, MB	✓
Louis Dreyfus Company Canada ULC					✓	403-205-3322	Calgary, AB	✓
Masterfeeds				✓		403-327-2555	Lethbridge, AB	
Marina Commodities Inc.			✓	✓		204-937-2300	Roblin, MB	✓
Maviga NA., Inc.		✓	✓	✓		306-721-8900	Regina, SK	✓
Monsanto					✓	–	Winnipeg, MB	
Natural Proteins					✓	204-355-5040	Blumenort, MB	✓
North American Food Ingredients					✓	204-272-5510	Winnipeg, MB	✓
Nutri-Pea Ltd.				✓		204-239-5995	Portage la Prairie, MB	
Nu-Vision Commodities	✓					204-758-3401	St. Jean Baptiste, MB	
Parrish & Heimbecker Ltd.					✓	204-987-4320	Winnipeg, MB	✓
Paterson Grain				✓	✓	204-956-2090	Winnipeg, MB	✓
• FeedMax Corp.				✓		204-523-0682	Killarney, MB	✓
Providence Grain Group	✓	✓	✓	✓	✓	780-997-0211	Fort Saskatchewan, AB	✓
Quarry Seed					✓	204-467-8877	Stonewall, MB	
Remillard Seed Farm					✓	204-737-2376	St. Joseph, MB	
Richardson International				✓		204-934-5627	Winnipeg, MB	✓

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COMPANY	EDIBLE BEANS	FABA BEANS	LENTILS	PEAS	SOYBEANS	PHONE	LOCATION	CGC REGULATED
• Richardson Pioneer Ltd.				✓	✓	204-934-5627	Winnipeg, MB	✓
• Tri Lake Agri				✓		204-523-5380	Killarney, MB	✓
S.S. Johnson Seeds	✓			✓		204-376-5228	Arborg, MB	✓
Scoular Canada Ltd.	✓	✓	✓	✓	✓	403-720-9050	Calgary, AB	✓
Seaboard Overseas		✓	✓	✓		306-565-3934	Regina, SK	
Seed-Ex Inc.					✓	204-737-2000	Letellier, MB	✓
Shafer Commodities					✓	204-822-6275	Morden, MB	✓
Simpson Seeds			✓			306-693-2132	Moose Jaw, SK	✓
Southland Pulse			✓	✓		306-634-8008	Estevan, SK	✓
Sunrich LLC					✓	507-446-5642	Hope, MN	
Thompsons Limited	✓		✓	✓		519-676-5411	Blenheim, ON	✓
Vanderveen Commodity Services					✓	204-745-6444	Carman, MB	✓
Viterra Inc.	✓	✓	✓	✓	✓	Contact your local Viterra sales representative		✓
Walhalla Bean Co. (Canada Ltd.)	✓					701-549-3721	Walhalla, ND	✓
• Winkler Receiving	✓					204-325-0767	Winkler, MB	✓
Wilbur Ellis	✓		✓	✓		204-867-8163	Minnedosa, MB	✓
Zeghers Seeds Inc.			✓	✓		204-526-2145	Holland, MB	✓

The Canada Grain Act requires some elevators and grain dealers to have a Canadian Grain Commission (CGC) license and post-security to cover their liabilities – what they owe to farmers. Grain dealers and operators of primary, terminal and process elevators in Western Canada are licensed by the CGC. Seed cleaning plants that do not purchase grain and feed mills do not have to be licensed. The pulse and soybean crop buyers listing includes only companies that are licensed and secured by the CGC (or exempted by regulation), and who are registered to submit check-off to MPSG. It is the responsibility of the farmer to ensure the company they are dealing with is reliable. Questions regarding licensing and security should be directed to the CGC at 1-800-853-6705 or 204-983-2770. To be included on MPSG's pulse and soybean crop buyers list, contact the MPSG office at 204-745-6488 for the buyers registration package.

Soybean Scout ANSWERS

A – Septoria brown spot *(Septoria glycines)*

Septoria brown spot is a common soybean foliar disease that thrives in warm, wet conditions. The fungus survives on infected leaf and stem residue. It can occur at any development stage. Symptoms include purple lesions on young soybean leaves, and small irregularly shaped, dark brown lesions on older leaves. Lesions are visible on upper and lower leaf surfaces. Similar lesions can occur on stems, petioles and pods. Infected leaves can eventually drop. This disease starts in the lower canopy, progressing upward if favourable conditions persist. Management options include crop rotation, incorporation of infected residue, and foliar fungicide. Brown spot has a moderate impact on soybean yield and quality in Manitoba. Yield loss depends on how far the disease has progressed up the canopy during grain fill.

B – Bacterial blight *(Pseudomonas syringae)*

Bacterial blight, another common foliar disease of soybeans, thrives in cool, wet conditions. Bacteria overwinter in residue and seed, and can be spread by rain and wind. It can occur at any development stage, and young leaves are most susceptible. Leaf and pod symptoms include small, angular, reddish-brown lesions with water-soaked margins, surrounded by a yellow halo. Lesions eventually grow together producing irregularly shaped dead areas. Management options include crop rotation, incorporation of infected residue, and avoiding field activities when foliage is wet. Foliar fungicides do not provide protection against bacterial diseases. Bacterial blight has a low impact on soybean yield and quality in Manitoba, but it is of greater concern when soybeans are grown for seed.

Recipe Corner

Creamy Blueberry and Lentil Lime Popsicles

Servings: 8 | Preparation time: 10 minutes | Total time: 4 hours 10 minutes

1/2 cup (125 mL) cooked **split red lentils**

1 Tbsp (15 mL) grated ginger

1 cup (250 mL) vanilla Greek yogurt

1 1/2 cups (375 mL) fresh blueberries

2 limes, juice and zest

1/3 cup (85 mL) sweetened condensed milk

Directions

1. Place all ingredients into a blender or food processor. Purée until smooth and transfer to popsicle moulds.
2. Freeze 4–6 hours.
3. Once popsicles are fully frozen, dip the base of the moulds in warm water for a few seconds. This will help with releasing the popsicles.
4. Serve immediately and enjoy!

Piña Colada White Bean Smoothie

Servings: 4–6 | Total preparation time: 5 minutes

1 cup (250 mL) cooked **white beans**, rinsed well

2 cups (500 mL) pineapple juice

1 can (400 mL) light coconut milk

1/2 cup (125 mL) mashed ripe banana

1 1/2 cups (375 mL) crushed ice

1/2 cup (125 mL) vanilla Greek yogurt, fat free

2 Tbsp (30 mL) honey

1 Tbsp (15 mL) fresh lime juice

Directions

1. Place all ingredients into a blender and purée until smooth.
2. Pour into glasses, garnish with a slice of lime and serve immediately.


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VARIETY	MATURITY	YIELD AVERAGE*
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Akras R2	2375 CHU (00.3 RM)	106%
Lono R2	2450 CHU (00.5 RM)	103%

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VARIETY	MATURITY
Marduk R2X	2425 CHU (00.2 RM)
C4M16161 R2X (Name Pending Registration)	2425 CHU (00.2 RM)

To see a complete list of the BrettYoung soybean trial locations, visit:

brettyoung.ca/soybeantrials

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*Data from 2015 & 2016 Manitoba Crop Variety Evaluation Team and Western Adaptation Trials. Yield as % of trial Mean.