ALBERTA CANOLA
SaskCanola
Manitoba Canola Growers
canolacouncil OF CANADA

January 2021

canola DIGEST

The Source for Canada's Canola Growers

Precision progress

WHILE PLANTERS CAN, IN THEORY, PROVIDE A PICKET FENCE OF UNIFORM CANOLA PLANTS, CAN THEY WORK FOR FARMS THAT WANT ONE SEEDING TOOL THAT WORKS IN A NO-TILL SYSTEM? / PAGE 12

INSIDE:

SEIZE
the Power of Placement.

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The TriMax™ Triple-Shoot System is comprised of three different air streams in combination with the NEW 3330SE or 3335QDA ParaLink™ Dual Shank Opener (PLD) & Mid Row Banders®.

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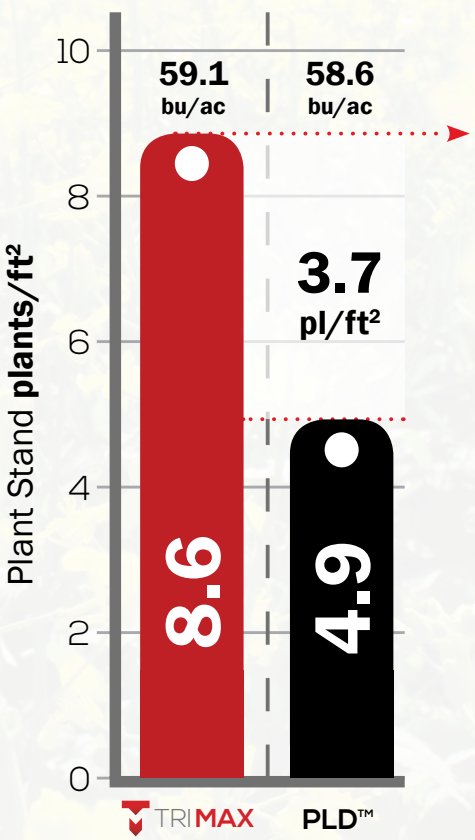
At what cost to your livelihood are you ignoring the facts?

2020 CANOLA TRIALS



75%

increase in plant stand with the Bourgault TriMax™ System vs the ParaLink™ Dual Shank System

TRIMAX ParaLink™ Dual Shank (PLD™ & MRBs®)

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2	**Side-Band**	Phosphate 50 lb/ac
		Nitrogen 10 lb/ac (with Phos.)
		Potassium 10 lb/ac
3	**Mid Row Band**	Nitrogen 130 lb/ac

ParaLink™ Dual Shank (PLD™ Only)

1	**Seed Row**	Canola 5.6 lb/ac
2	**Side-Band**	Phosphate 50 lb/ac
		Potassium 10 lb/ac
		Nitrogen 140 lb/ac

SEIZE the Power of Placement. **REAP** the Rewards.

For more information on this year's canola trials visit: www.bourgault.com

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January 2021

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Photo: Tempo

PRECISION PLANTING IN NO-TILL SYSTEMS

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Responsible Grain is seeking farmer feedback on a draft code of practice for Canada's grain industry. To sign up for online consultation, visit **responsiblegrain.ca** or email **info@responsiblegrain.ca**.

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The new Canadian Agri-Food Automation and Intelligence Network (CAAIN), which includes the smart farms at Olds College and Lakeland College, will help innovators make the connections necessary to test an idea and bring it to market.

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Photo: Justine Cornelsen

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Alberta's Marketing Council has made it possible for Alberta Canola to hold an online Annual General Meeting (AGM). Alberta canola producers must register by January 12 in order to vote during the AGM. In other news, Alberta Canola has launched a new online research database at **albertacanola.com/research**.

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SaskCanola updates on blackleg and verticillium stripe research projects it co-funded with Alberta Canola and Agriculture and Agri-Food Canada (AAFC). SaskCanola will hold its AGM January 12 in conjunction with five other commodity groups in Saskatchewan. Winners of Roger Rimmer awards announced.

10 Manitoba Canola Growers

Manitoba Canola Growers encourages members to share their thoughts on the draft Responsible Grain Code of Practice. COVID-19 forced MCGA to try a new approach for its 2020 Canola Learning Centre program. The 2021 AGM is online. Email resolutions to **delaney@canolagrowers.com** by January 25 at 4:00.

CALENDAR

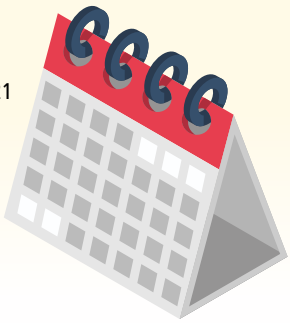
SASKCANOLA ANNUAL GENERAL MEETING
ONLINE – Tuesday, January 12, 2021
cropsphere.com

ALBERTA CANOLA ANNUAL GENERAL MEETING
ONLINE – Tuesday, January 26, 2021
albertacanola.com/vote

MANITOBA CANOLA GROWERS ANNUAL GENERAL MEETING
ONLINE – Thursday, February 11, 2021
canolagrowers.com

CANADIAN CROPS CONVENTION
ONLINE – Wednesday, March 3, 2021 (morning)
canolacouncil.org

CANOLA COUNCIL OF CANADA ANNUAL GENERAL MEETING
ONLINE – Thursday, March 18, 2021
canolacouncil.org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TOUGH WEEDS IN CANOLA? STRIKE BACK WITH A LITTLE 'TUDE.

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Simple life

My great uncle Clint Whetter farmed a mile up the back road from our farm in southwest Manitoba. He was the youngest of four sons, a U of M Aggie and World War II veteran. He was on a bomber crew that flew 58 operations over Germany. Having to protect his stuff from three older brothers, get himself through university and follow the RCAF standard operating procedures likely all influenced his character because, man, he was organized. He had a wall on his shop painted a glistening white with a hook for every hand tool. And, for the pièce de résistance, every tool spot was outlined in black marker so he knew where each tool went and, most importantly, whether it had been put back. As a kid, I would marvel at that wall with 90 per cent awe and 10 per cent ridicule saved for really anal people.

I didn't fully appreciate the value of that wall until 30 years later when I watched Swede Ove Karlsson talk about the "Lean" concept at FarmTech 2020. His presentation included a photo of a tool wall with hooks and black silhouettes just like my dear uncle's. Light bulb.

Karlsson emphasized that taking a few hours to clean up the shop, organize the inventory and set up a tool wall can save lots of time and frustration in the future. The "Lean" concept is not quite a Marie Kondo level of clean up, but it does encourage us to look at the hours we spend in a day and see which ones provide value to ourselves and our customers and which ones are wasted. The definition of "wasting time" will be different for each of us. I would argue that spending more than five seconds looking for a pen is a travesty, but spending an hour going for a walk is essential.

Simplicity was a sub-theme for a virtual presentation I attended later in the year. My colleague Brittany Dyck, senior manager, canola utilization with the Canola Council, invited me along for a webinar she hosted to promote the use of canola meal in Canadian dairy rations. The guest speaker was Daniel Scothorn, a Nova Scotian who coaches dairy managers on nutrition and more. His business mantra: "You need to start with good rations, but coaching takes the business to the next level."

At the core of Scothorn's recommendations is to keep it simple. "I've seen dairy diets with 30 to 40 ingredients, but cows evolved on three feeds – grass, dirt and water," he says.

With that as a start point, he works with dairy managers to rebuild their feed regime. In his coaching, Scothorn starts with the basic question, "What are your goals?". When he has the answer, he asks, "Why is that goal important to you?" Then, to keep adding value to customers over the months and years, he has a routine set of questions that he repeats with each visit.

They are:

1. What's important to you today?
2. Before I walk through your herd, is there anything I should pay special attention to?
3. After I walk through the cattle, are you able to spend 20 minutes reviewing my observations?
4. The last time I was here, you said _____ was a problem. Is this still a problem?
5. Let's review your current feed costs. What do you think about your feed choices?

Being organized and almost ritualistic with his questions, Scothorn has what could be called a "Lean" approach to coaching, coaxing critical thinking and better decisions. Simple, but effective.

He also has this gem that I have to include: "Ask yourself, is it acceptable to be 90 per cent right? Because the final 10 per cent is going to cost a lot of money."

When I think back to uncle Clint's tool wall, I realize now that I should focus on my "90 per cent awe" and strive for the simpler life that demarcated tools can provide. The other 10 per cent, the ridicule for anal people, is a wasteful thought that has cost me a lot of time looking for pens and screwdrivers and keys.

–For more on the "Lean" concept, read the Business Management article in this issue.

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Alberta Canola's 31st Annual General Meeting

JANUARY 26, 2021 9:30-10:30AM

The 2021 Annual General Meeting will be held online. This marks the first time that canola growers in Alberta will be able to participate in and vote at the Annual General Meeting without needing to be physically present.

We are grateful to Alberta's Marketing Council that oversees the operations of commissions in Alberta for allowing this online opportunity. Regardless of where you live in Alberta, we are looking forward to bringing the Annual General Meeting to your farm.

AGM AGENDA INCLUDES:

- A review of the activities, audited financial statements, and budget for Alberta Canola
- A Region 5 director election if required and voting on resolutions.
- Resolutions to be presented at Alberta Canola's AGM must be received no less than 10 business days prior to the AGM (by January 12, 2021) to allow for background to be collected and resolutions to be prepared for presentation at the meeting.

REGISTERING TO VOTE ONLINE

Farmers in Alberta that have sold canola and paid a service charge on canola to Alberta Canola since August 1, 2018 are eligible canola growers and can register to vote at Alberta Canola's Annual General Meetings.

Eligible canola growers can be individuals or represent a corporation, partnership, or organization. To ensure the integrity of the voting procedure, growers will need to register to vote. This will allow Alberta Canola to verify eligible voters, and enable our third-party voting provider to provide growers with a unique access code to allow them to vote.

Voter registration closes January 12, 2021
For more details and to register, please visit **albertacanola.com/vote**.

Photo: iStock.com/danijelala

Alberta Canola Director Nomination Results

The call for nominations for farmers to serve on the Board of Directors of the Alberta Canola Producers Commission resulted in three canola producers being re-elected by acclamation.

Andre Harpe from Valhalla Centre in Region 2, Ian Chitwood from Airdrie in Region 8 and Roger Chevraux from Killam for Region 11 will all serve a second term as director.

Region 5 received no nominations and therefore a new nomination period for a Region 5 director is now open until January 12, 2021. An election will occur during Alberta Canola's Annual General Meeting on January 26, 2021.

For more information on becoming a director to represent Alberta Canola's Region 5, and to download nomination papers please visit **albertacanola.com/elections**.

IAN CHITWOOD
Region 8

ANDRE HARPE
Region 2

ROGER CHEVRAUX
Region 11

Alberta Canola – working for all canola growers in Alberta

Alberta Canola focuses on four key areas:

- Research
- Grower Relations and Extension
- Public Engagement and Promotion
- Government and Industry Affairs

Our activities in these areas are guided by our elected farmer directors and driven by our mission statement: to improve the long-term profitability of Alberta's canola producers. For complete details, check out our Annual Report and our 'Year in Review' video (featuring the farmer directors) on our website at **albertacanola.com/annualreport**.

New Research Database

Alberta Canola's main driver for supporting research projects is simply helping farmers succeed in growing canola. The unbiased nature of this work, which focuses on solving the challenges that farmers are facing in their fields, is key.

Alberta Canola has been committed to supporting growers by providing the latest research freely available and making relevant and useful research available as quickly as possible.

We are delighted to announce the establishment of our new research database on our website: **albertacanola.com/research**.

Visit **albertacanola.com/research**

Category	Title	Lead Researcher	Years Active	Status
Genetics	Improving heat and drought resistance in canola through regulating diacylglycerol acyltransferase activity	Gavin Chen	2020 - 2023	Complete
Canola Oil	Establishing the important of canola-derived long chain n-3 polyunsaturated fatty acids on immune development	Catherine Field	2020 - 2023	Ongoing
Insects	Natural Sciences and Engineering Research Council Industrial Research Chair in Agricultural Entomology	Boyd Mori	2020 - 2025	Ongoing
Agronomy, Insects, Stand Establishment	Evaluating the effect of canola seeding rate and seed size seeded into wheat stubble on flea beetle damage and population	María Angélica Ouellette	2020 - 2023	Ongoing
Diseases	Clubroot inoculum management for sustainable canola production	Stephen Strelkov	2019 - 2022	Ongoing
Diseases	A rapid molecular assay to identify Plasmodiophora brassicae pathotypes from plant and soil samples	Stephen Strelkov	2019 - 2022	Ongoing
Insects	Biocontrol potential of entomopathogenic nematodes against selected key insect pests of canola in Alberta	Paul Tiege	2019 - 2020	Ongoing
Canola Meal	Rapid detection and degradation of mycotoxins in animal and poultry feed materials	Roopesh Syamaladevi	2018 - 2021	Ongoing
Diseases, Genetics	Exploring Brassica oleracea for resistance to the newly emerged Plasmodiophora brassicae pathotypes: Resistance mapping and introgression into canola	Habibur Rahman	2018 - 2021	Ongoing

Alberta's four major crop commissions are producing the 2021 Blue Book

Alberta's Crop Protection Guide, more commonly known as the Blue Book, is now being produced by Alberta's four major crop commissions - Alberta Barley, Alberta Canola, Alberta Pulse Growers and the Alberta Wheat Commission. The commissions are currently developing the 2021 Blue Book, formerly published by Alberta Agriculture and Forestry, which will be available in March 2021.

"Having the most current information on crop protection products is essential, it allows farmers to protect consumers, the environment and their crops. We are pleased to be working with the other crop commissions on this important project." says John Guelly, Alberta Canola Chair.

The Blue Book project has been made possible in part by the Government of Canada and the Government of Alberta through the Canadian Agricultural Partnership. Print and digital copies of the 2021 Blue Book will be available in March. Visit **albertabluebook.com** and subscribe to the email list to receive updates and news on release dates, or to place advanced pre-orders for the 2021 Blue Book.

Canola AgriScience Cluster research projects focus on blackleg and verticillium


Photo: Justine Cornelsen

The canola industry currently contributes over $26 billion annually to Canada's economy, and faces evolving threats to yield and concerns from major export markets due to blackleg and verticillium stripe.

Blackleg remains a serious disease of canola and can cause significant yield losses, especially in susceptible varieties. In Western Canada,yield losses as high as 50 per cent have been reported in individual fields. In 2017 alone, Canadian canola yield losses to blackleg were estimated at $500 million. However, potentially losing China as a major importer of canola due to blackleg issues would have an annual economic impact of $3.4 billion. For many years, blackleg was effectively managed primarily through variety resistance and longer rotations. However, over the past 10 years researchers have found evidence of virulence changes in the pathogen to defeat major resistance, resulting in a steady increase in disease incidence in previously resistant varieties. Blackleg requires an integrated management strategy utilizing the best agronomic practices, including longer crop rotations and selecting varieties with alternative R-gene packages to minimize yield loss and maintain the effectiveness of genetic resistance.

Verticillium stripe is a new disease to Canada, first found in Manitoba in 2014. Since then, the disease incidence has been gradually increasing in the Canadian Prairies. According to the Canola Council's agronomy specialists, large numbers of verticillium-infected fields were found in Manitoba and Saskatchewan under hot and dry growing conditions in 2020. While this pathogen has not yet been identified as having any trade implications, there is a lot to learn about this new disease: disease incidence, severity, impact and management strategies.

To further support Canadian canola industry, minimize yield loss and trade disruption caused by blackleg and verticillium stripe, SaskCanola, Alberta Canola and Agriculture and Agri-Food Canada (AAFC) co-funded nine research activities focused on developing resistant varieties along with disease management strategies. These research activities were included into the existing Canola AgriScience Cluster (2018-2023) in 2019. The $5 million joint funding, comprised of nearly $3 million through AAFC's Canadian Agricultural Partnership and $2 million from Alberta Canola and SaskCanola, was committed towards supporting these research activities.

The list of research activities in Cluster Theme 7 include:

- Developing a robust system for efficient assessment of quantitative resistance (QR) in commercial canola varieties for blackleg management
- Developing tools for the rapid screening of canola germplasm for quantitative resistance to disease
- Understanding the critical infection window that causes blackleg of canola in Western Canada
- Fine-tuning of the blackleg yield loss model in canola
- Improving management of blackleg on canola via better flea beetle control and effective fungicide seed treatment in Western Canada
- Improving blackleg resistance durability through R-gene rotation in commercial fields on the Canadian prairies – a science-based stewardship program
- Genetic dissection of the Rlm3-4-7-9 blackleg R-gene cluster and KASP marker improvement
- Verticillium disease etiology and nursery
- Genetics and genomics of Brassica-Verticillium interaction

These critical research activities being carried out under the Canola Cluster Theme 7 will fill knowledge gaps in blackleg and verticillium stripe management. They will also lead to new genetic resistance and management strategies for more sustainable production, and maintain canola's economic potential for Canadian producers.

Register for virtual AGM on January 12

SaskCanola's Annual General Meeting will take place virtually on Tuesday, January 12 at from 9:30 to 10:30 a.m. in conjunction with five other commodity groups in Saskatchewan.

Registration details can be found at **cropsphere.com**. Registered canola producers are encouraged to sign up early to vote on important issues upcoming in the canola industry.

Resolutions: We encourage people to contact the SaskCanola office at **info@saskcanola.com** if they would like to bring forward a resolution to be presented at the AGM. We look forward to hearing from our levy payers!

Winners of Roger Rimmer awards

SaskCanola supports the growth of human capacity in our innovative canola sector. The prestigious Dr. Roger Rimmer Award for Excellence in Graduate Research offers $18,000 per year for a maximum of two years to students who are entering or continuing studies in a masters or doctoral program. The goal of the program is to foster innovation within young minds entering the field of canola research.

Recipients of the 2019-20 scholarships are:

- Rajeev Dhakal (new) who is identifying genomic regions responsible for nitrogen use efficiency in canola.
- Ivanthi Kumasaruge (new) who is working on clubroot resistance with the use of molecular cloning techniques.
- Blend Frangu (renewal) who is studying long-term environmental and productivity impacts of canola from crop rotation practices.

Left: Rajeev Dhakal

Right: Ivanthi Kumasaruge

Four SaskCanola directors elected

Elections for the SaskCanola Board of Directors were held during the month of November. There were a total of eight candidates for four positions. Elected were:

- Dean Roberts, Coleville
- Codie Nagy, Ogema
- David Altrogge, St. Benedict

Re-elected to a second term was Keith Fournier of Lone Rock.

The newly elected directors will start their four-year term following the SaskCanola Annual General Meeting on January 12. They will be joining four existing directors: Katelyn Duncan of Regina, Charlene Bradley of Stranraer, Bernie McClean of Glaslyn and Lane Stockbrugger of Englefeld.

Thank you to all growers who let their names stand in the election.

Photo: iStock.com/bortonia

Share your thoughts on the Code of Practice

Canada has long held a reputation for producing excellent quality crops using sustainable practices, and an initiative is now underway to document these practices and build upon them so that future generations have healthy soils, air and water. This will provide proactive guidance for how Canadian farmers can continue to protect and build on our strong reputation, and identify changing practices that will improve sustainability.

Your input on the drafted Responsible Grain Code of Practice is critically important to ensure the document provides balance between practical and realistic crop production practices while addressing issues that are of interest or concern to grain buyers and consumers, both in Canada and around the world. The Responsible Grain Code of Practice was drafted by a committee of farmers, scientists, commodity organizations and industry representatives. Now that the draft standards are complete, your feedback is needed to understand how the Code would impact production at the farm level.

MCGA will be engaging our membership and board throughout the consultation period to ensure everyone has the opportunity to share their comments on this important document. Expect to hear from us between November 2020 and February 2021. Your opportunity to review and comment on the draft standards will be facilitated via an online workspace. To receive your invitation directly to comment on the Responsible Grain Code of Practice, visit **responsiblegrain.ca/landing/**.

Virtual Annual General & Special Meeting

SAVE THE DATE

FEBRUARY 11, 2021 | 10:00 AM

Pre-Registration Required.
*Details at **CanolaGrowers.com***

By-law changes will be presented at this meeting.

Resolution Deadline:

All resolutions must be submitted to the Manitoba Canola Growers office by January 25, 2021 at 4:00 CST. Email them to **delaney@canolagrowers.com**

Ag Literacy for Tomorrow's Leaders

Youth are the decision makers of tomorrow.

This is the driving force behind Manitoba Canola Growers Association's strategic direction to engage with youth to create a deeper understanding of agriculture and canola through interactive learning opportunities.

Traditionally, one of the foundations of MCGA's youth programming pillar is the Canola Learning Centre, a free farm tour aimed at educating urban students and their educators about canola and other Manitoba crops in a real farm setting using fun, entertaining, hands-on activities.

The impacts of COVID-19 unfortunately forced the cancellation of the 2020 Canola Learning Centre season. That is when MCGA decided to try something a little different to bring the Canola Learning Centre into classrooms all year round.

"As a parent, helping my kids with remote learning this spring, I was intrigued by some of the activities being sent home. I started exploring how agriculture could be represented in resources to support teachers and engage students through these challenging times." says Leanne Campbell, Communications Manager and lead of youth programming for MCGA.

Over the summer of 2020, MCGA staff partnered with Agriculture in the Classroom – Manitoba and an amazing teacher, Emma Rathgeber who develops and shares educational resources through the Teachers Pay Teachers platform. Rathgeber created resources aimed at students in grades three, four, five and six that are tightly tied to existing Manitoba curriculum making it easy for teachers to bring a little bit of agriculture into their classrooms.

"After launching these resources in September, we saw success right away with impressive uptake and positive feedback from teachers" says Campbell, "We are already working with AITC-M and another teacher to help us create the next round of resources to launch in the spring."

Given the current pandemic and the changing approach to education, MCGA is unsure what the future holds for Canola Learning Centre in 2021 and beyond. These new resources will offer a way for students across the province to connect with the farm, even if a farm visit is not possible.

Feel free to share these resources with teachers in your communities.

To download visit ***CanolaGrowers.com*** *and click on Education.*

Photo: iStock.com/brightstars

While planters can, in theory, provide a picket-fence of perfectly spaced, uniformly-emerging canola plants, the path to get there is full of challenges for farms in Western Canada who want one seeding tool that works in a no-till system.


Photo: Gregory Sekulic

PRECISION PLANTING IN NO-TILL SYSTEMS

BY NATHANIEL ORT

Planters are engineered for precise seed depth and seed spacing, and could take canola seed placement to a new level of precision. The challenge for canola growers considering a planter is to justify the cost and maintenance of a second seeding system and to make them work in the no-tillage or direct-seeding systems that are common in Western Canadian agriculture.

Seeding is the most important pass in canola production. Without this pass there is no harvest, and every mistake made at seeding can haunt the crop through the remainder of the growing season. Furthermore, farmers face immense pressure during this time to cover as much ground in a day as possible, while maintaining best management practices surrounding plant establishment. This is the balancing act of seeding. Can planters keep the balance?

Kristjan Hebert has been using precision planters for canola over the past three years on his no-till farm at Moosomin, Saskatchewan. He knows that precision planters require a large capital investment and come with consistent maintenance expenses. It can be a challenge to spread this expense over the whole farm. "Unless the environment where you farm is capable of growing corn, soybean or other established row crops, a precision planter cannot be the only seeding implement on your farm," Hebert says.

"Our biggest challenge is logistics," he says. Operating two different types of seeding implement has increased the complexity of their seeding operation: fertilizer, seed,

and fuel logistics, as well as implement maintenance and repairs are all different between an air drill and a planter. This warrants unique equipment to deliver or meet the requirements of a planter. Furthermore, if land is farmed across a large geography, implements may be working far apart, further increasing seeding logistic complexity.

The next hurdle is seed placement in a direct-seeded system. Philip Korczak, regional manager with Väderstad, says no-till planting is entirely possible if appropriate hardware is installed to move or break through surface residue. Väderstad, like other planter companies, offers optional row cleaners to help remove crop residues, clumps and stones. However, Korczak says you may have to keep the option open for a tillage pass if your field is too hard from compaction or has too much surface residue due to harvest practices the fall before.

Another challenge with planters, Korczak says, is to maintain optimal depth because of how difficult they can be to push a double disc into no-till heavy soils. If this is a potential issue, he recommends hydraulic weight transfer, which is available on their Tempo planters. By enabling both positive and negative pressure, this feature ensures the best start possible for each type of seed and the specific field soil conditions.

"Unless the environment where you farm is capable of growing corn, soybean or other established row crops, a precision planter cannot be the only seeding implement on your farm."

–Kristjan Hebert

North Valley Precision Planting, based out of Homewood, Manitoba, provides solutions to the specific challenges growers often face when using their planters for canola. These challenges can include toolbar performance monitoring, metering, downforce and furrow closing. Manager Carl Havixbeck and product specialist John Fox see individual row downforce, with a product like DeltaForce by Precision Planting, as an important step to manage field variability. They note that soil type, residue cover and soil moisture change throughout a field, which subsequently alters the downforce pressure required for achieve targeted seed depth and good seed to soil contact.

Finally, the nature of canola seed makes it more difficult to achieve the picket fence of plants that we often see in precision-planted corn and soybean fields. In the short distance between the metering wheel and the soil, canola seeds encounter static and friction between the seed and seed tube, vibration from the implement itself and bounce in the seed row – all of which can break up the picket fence.

Photo: Tempo

This canola was seeded with a precision planter. Disc planters will see improved performance in no-till if stubble is long and chopped residue is kept to a minimum.

Korczak says the Tempo planter is capable of successfully planting canola in no-till at seven to eight miles per hour. On traditional vacuum planters, the seed falls freely from the seed meter through the tube and into the soil. When vibrations arise as the speed increases, the seed bounces in the seed tube and much of the precision of the seed meter is lost. The Tempo system uses air pressure to maintain full control of the seed all the way down to the soil.

Bourgault has a new Air Planter option with planter-style singulation to each seed row. It can be put on hoe drills, which are the common no-till seeding tools in Western Canada, and on disc drills.

Curtis de Gooijer, agronomist with Bourgault Industries says, "We can get canola seed to meter out very precisely, but challenges persist in maintaining this until the seed row."

De Gooijer recognizes that disc drills have additional challenges over hoe drills in no-till conditions in general. "With discs, typically a working of the ground ahead of time is necessary to take care of the trash to decrease the amount of hair pinning," he says. "Hair pinning is when straw is sent in the bottom of the trench where the seed goes so there is not very good seed to soil contact."

HARVEST PRACTICES CAN HELP WITH NO-TILL PLANTING

De Gooijer says disc opener performance in no-till can be improved with harvest practices like stripper headers and higher cut heights to keep more straw standing.

Gregory Sekulic, agronomy specialist with the Canola Council of Canada, has seen good results from a Pillar Laser disc planter working in heavy residue. "Like all discs, it faces the challenge of good seed placement in soils covered with a mat of thick chaff and short straw," says Sekulic. But at one demo in 2020, the Pillar Laser planter seeded into unharvested abandoned wheat crop with impressive results, he says.

In this unique situation, the straw was long and there was no cover of fresh chaff. It made Sekulic realize that no-till planting can work with a change in harvest practices. "Long, undisturbed straw is easier to work with than fields where the crop was shaved and put through the combine," he says. That is where cutting high, and possibly using stripper headers, could make a big difference.

A final challenge with planters is fertilizer placement — especially in a no-till one-pass seeding system where the placement of choice is beneath the soil surface. However, many seeding implements and seed openers have been designed to combat this. Seed-row, side- and mid-row banding configurations, as well as combinations of these, are available from many equipment suppliers across Western Canada.

The goal for any canola seeding operation, regardless of the seeding implement used, is uniform plant stand with high seed survival. The tools and technology are available for precision planting in no-till systems, but the logistics of seeding, including time management, input delivery, in-season repairs and maintenance, must be taken into consideration. After reading this article and considering the potential challenges, is a precision planter the right tool for the job on your farm?

If yes, reach out to your equipment manufacturer of choice. Many manufacturers conduct field-scale trials with their equipment and are extremely knowledgeable in this area.

While precision planting of canola is an area of continuing research, technology has addressed many of the challenges for no-till farmers of Western Canada. As always, the many bright minds in our industry have addressed challenges and provided solutions that continue to strengthen canola plant establishment and productivity.

–Nathaniel Ort is an agronomy specialist with the Canola Council of Canada. Email ortn@canolacouncil.org.

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Canola growers and agronomists can use spore detection tools to identify the presence of the sclerotinia pathogen in a field. This answers a major question – but not the only question — when it comes to sclerotinia stem rot risk.

HOW TO USE **SPORE TESTERS** FOR SCLEROTINIA

BY TREENA HEIN

Sclerotinia stem rot management relies on fungicides, for the most part, and several new spore density measurement tools are also available to help growers pinpoint if and when to spray.

Clint Jurke, Canola Council of Canada agronomy director, wants growers to understand that these tools provide some of the information needed. Results of these tests answer the first of two questions about disease risk: Are the spores in the field at the time of flowering? But it doesn't answer whether present and projected environmental conditions are right for infection.

"If you are going to spray, you need to do it at 20 to 50 per cent bloom, but for the pathogen to move from the petals to the stem and cause disease, you need the following conditions to persist over the next two to three weeks: temperatures 15 to 25°C and high levels of moisture on the petals. That means your pants will get wet as you walk through the field in the afternoon," Jurke says. "If conditions are drying up and look to stay dry, the pathogen will of course still be there but will stop growing and not cause disease."

Jurke believes the canola industry is still working out how to position these tests in terms of spray decision-making, but says that any of these tools "are better than what we had five years ago."

PETAL TESTS

Quantum Genetix in Saskatoon has offered the Q-protect sclerotinia test since 2016, and general manager Heather Deobald says it continues to grow in popularity. To test with Q-protect, users collect three petals from eight plants over five sites in the field. Q-protect reports the percentage of plants infested with sclerotinia spores from each collection site as well as the overall percentage of plants infested in the field. The percentage of plants infested correlates to the risk of developing sclerotinia stem rot.

To help growers interpret test results, Quantum Genetix has a mobile app with a simple colour-coded "risk barometer".

"The app helps quantify the risk of yield loss so that it can be compared to the cost of disease protection," says Deobald. "Even though disease may occur, the cost of spraying may be equal to or higher than the cost of yield loss in some scenarios so the farmer may be better off not spraying. Alternatively, the app can illustrate how necessary spraying is when the cost of yield loss is much higher than the cost of spraying. With the ability to compare yield estimates, cost of spraying and risk of disease, farmers get an in-depth picture of their situations."

Farmers also utilize the reporting of sites to target spraying, perhaps only spraying at sites that showed a moderate to high sclerotinia presence. Farmers could also only target areas of high yield or moisture content if sclerotinia is present at those sites.

The canola industry is still working out how to position these tests in terms of spray decision-making, but says that any of these tools "are better than what we had five years ago."

–Clint Jurke

This is the petal collection kit from Quantum Genetix. Users collect three petals from eight plants over five sites in the field. Q-protect reports the percentage of plants infested with sclerotinia spores from each collection site as well as the overall percentage of plants infested in the field. Discovery Seed Labs also offers a petal test.

Photo: Quantum Genetix

Discovery Seed Labs has offered a sclerotinia petal test for two years and has also seen its use increasing. "We are going to limit the number of kits that are sold each season to ensure that we can meet the tight required turnaround time for customers to receive their results," says Jason Danielson, business manager at Discovery Seed Labs. "We expect in the next year or two to be sold out of kits for each testing year."

Danielson says the feedback on the kits has been very positive, with customers really liking the added specificity of results when kit results are combined with the company's sclerotinia calculator. "Some of our customers have used the kits in their research programs and were very impressed with how closely the kits were able to predict disease presence in the field," he says.

Test results show notable variability from field to field, with very low to very high presence of the spores. "The variability in results from different fields really demonstrates the importance of collecting the information of your specific fields of interest and combining the spore percentage with weather data to make an informed decision about whether or not to spray," Danielson says.

SPORE TRAPPING TOOL

For 20 years, Canadian horticulture crop producers have used systems that trap fungal spores in the air and identify pathogens present and their amounts. These are now coming to canola crops. In 2018, a system called Spornado Sampler was commercialized in Ontario. It has been used in Alberta on wheat and barley (for fusarium head blight) and canola (for sclerotinia).

Spornado units placed in a field trap spores in a "sample cassette". Growers or agronomists send the cassettes by courier to 20/20 Seed Labs in Nisku, Alberta. DNA analysis identifies the types and amounts of trapped spores. Growers are provided with a risk level of low, medium or high.

STUDIES UNDERWAY

Kelly Turkington, plant pathologist with Agriculture and Agri-Food Canada (AAFC) at Lacombe, Alberta, and his team trying various tools to measure spore load before and during canola flowering. They are pairing Spornado units with "rotorods", devices that measure the amount of *S. sclerotiorum* DNA per unit of time per unit volume of air. Turkington says the Rotorod has been used in research trials as far back as the 1970s and is currently mainly used in Canada for crop research and to monitor pollen levels for air quality determination.

"There isn't much research info on the Spornado and its results in relation to sclerotinia risk and need for fungicide," Turkington says. "Thus we are looking at its utility in terms of stem rot pathogen spore trapping and risk assessment."

As part of the study, they are also using quantitative polymerase chain reaction (qPCR) DNA tests to test canola petals in collaboration with Alberta Agriculture's plant health lab, and commercial DNA-based petal tests from Discovery Seed Labs and Quantum Genetix. "Our focus is to relate variation in spore load in relation to weather conditions and crop growth stage and how this impacts disease risk and fungicide application response," Turkington says. For fungicide response, they are studying single versus dual applications and early versus late applications.

In another research project, Xiujie Li, a senior research scientist at InnoTech Alberta, is working on a sensor that could provide quick results in the field. Li has developed a prototype hand-held bio-sensor that is now capable of detecting even a single *S. sclerotiorum* spore. It was field-tested this summer and the design is being modified to filter out non-desired materials.

–Treena Hein is an award-winning science writer and educational resource consultant.

Right: Eleanor McBain is a Masters student working with AAFC pathologist Kelly Turkington on spore collection. This image shows her set up, including Spornado, rotorod and weather stations, in one of her fields in Alberta in 2020.

Photo: Eleanor McBain

"The variability in results from different fields really demonstrates the importance of collecting the information of your specific fields of interest and combining the spore percentage with weather data to make an informed decision about whether or not to spray."

–Jason Danielson

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How do you test a new product?

On-farm trials are essential for farmers who want their own data on the effectiveness of new products and ideas. Setting up trials and taking them to harvest does requires a little extra work and planning, but the result is more informed decision-making and a better idea of what provides a return on investment – and what doesn't.

BY JAY WHETTER

CHRISTI FRIESEN
BROWNVALE, ALBERTA

Christi Friesen and her husband, Kelly, do a lot of on-farm trials. Companies often ask them to run trials to compare new products to existing products. Other times the trials go like this: Christi wants to use one fungicide and Kelly wants to use another. So they'll spray both and flag the strips. At the end of the season, they'll compare costs, ease of use and yield results to make a better decision on which one to use next time.

They also use everyday complications as a way to run little tests. In one situation, they were trying a new soil active herbicide. Christi Friesen was spraying ahead of the seeder but had a maintenance issue with the sprayer and couldn't finish the field. They decided to finish seeding anyway. Friesen went back the next day and sprayed the final 60 acres as a post-seeding, pre-emergence treatment. "The difference was night and day," she says. The undisturbed treatment applied after seeding provided much better results. Good record keeping and a mindset of experimentation allowed them to turn this experience into a learning opportunity.

A big part of their decision-making includes a review of past experience. For herbicides, for example, their records include product sprayed, spray timing, weeds present and weed staging. This last detail is important.

The Friesens will often use Conquer and glyphosate as a pre-burn on canola fields. Their notes say the tank mix worked really well on overwintered dandelions but didn't work that well on thistles that were much more than 10cm tall. "If we have big thistles again, we'll have to try something else," she says – which is another opportunity to run a trial.

For organized pesticide trials, the Friesens will replicate strips in the field and often run the trial in at least two fields – one on the north end of the farm and one at the south end. Strips are two sprayer widths, so around 240 feet wide. They'll take combine passes through the middle of these strips and weigh the results.

The Friesens put an Agrimatics scale in their grain cart last year. "We put most of our grain into storage bags, and with the bags, it can be difficult to estimate how much grain we've harvested," Friesen says. The scale comes with

Photo: Agrimatics

Christi Friesen installed an Agrimatics scale in their grain cart last year. With accurate calibration, they can use it to compare yields for check strips.

"A product has to pay for itself and then some. We won't go full farm with any product unless we can prove that the ROI is there."

–Christi Friesen

an app that draws up a tonnage and yield ticket for each field. "By weighing each load, we know what we have in each bag for crop insurance and marketing."

The bonus is they now have an accurate scale for comparing strip trial results. BASF brought its own weigh wagon when harvesting strip trials on the Friesen farm in 2020. This gave them a chance to calibrate their new scale. "It's really important to have the scale calibrated, and it was bang on," she says.

Friesen says strip trials and the required flagging, weighing and record keeping all help to improve their profitability. "A product has to pay for itself and then some. We won't go full farm with any product unless we can prove that the ROI is there."

DEAN ROBERTS
COLEVILLE, SASKATCHEWAN

Dean Roberts says, "I'm not afraid to try anything, but I'm by no means an early adopter."

His process of trying a new idea "relies pretty heavily" on his local G-Macs AgTeam. He also checks neighbours' farms first to see what's working in his specific area. Western Applied Research Corporation at Scott does a lot of good research, he says, but even though it's fairly close to Coleville, "the weather is so much different from ours". So he'll pay attention to their research results, but he'll want confirmation that it'll work on his farm.

He also considers the reputation of the company bringing a new product to market. "Most products from the mainstream companies will work, and they have the brand behind it."

Once he has a good sense that a new product will provide an economic benefit on his farm, Roberts will spray a whole field and leave untreated strips to do an on-farm comparison.

"If you can't see a visual difference with the naked eye, the return on investment probably isn't there," he says. He wants a difference of at least two bu./ac. to justify an input.

Trying a new pesticide or crop input may be low risk, but Roberts still doesn't want to spend money on things that don't work. "Margins are getting tighter, so every input is carefully considered," he says. "We want any investment in the crop to work every time. If it works, we jump in hard."

"Margins are getting tighter, so every input is carefully considered. We want any investment in the crop to work every time. If it works, we jump in hard."

–Dean Roberts

KATELYN DUNCAN
REGINA, SASKATCHEWAN

Katelyn Duncan does "a lot of trials" and this willingness to experiment attracts a lot of interest. "We're open to trying new things and, as a result, we often get products for free," she says.

It means the Duncans can do a lot more experimenting at a lower cost. In return, the companies get Western Canadian field results for their new products.

Over the past couple of years the Duncans have run micronutrient trials on canola, plant growth regulator trials on durum wheat and various seed trials. They often treat 20- to 40-acre blocks, planting trial acres in an "average spot" in the middle of a field with the untreated crop all around it.

For easy record-keeping, the Duncans set up the trial as a "task" in Climate FieldView, which marks the acres as treated or untreated. The program keeps details on the field sites and allows them to map yield differences at harvest using the combine monitors. "The results are effective for our own learning, but I wouldn't publish them," Duncan says.

In the end, many of the products they try don't provide a clear benefit – but that still justifies the work. By trying a lot of different things, the Duncans are more likely to discover those few treatments that might actually improve the bottom line in their part of southern Saskatchewan.

Many of the products Katelyn Duncan tries don't provide a clear benefit – but that still justifies the work. By trying a lot of different things, the Duncans are more likely to discover those few treatments that might actually improve the bottom line in their part of southern Saskatchewan.

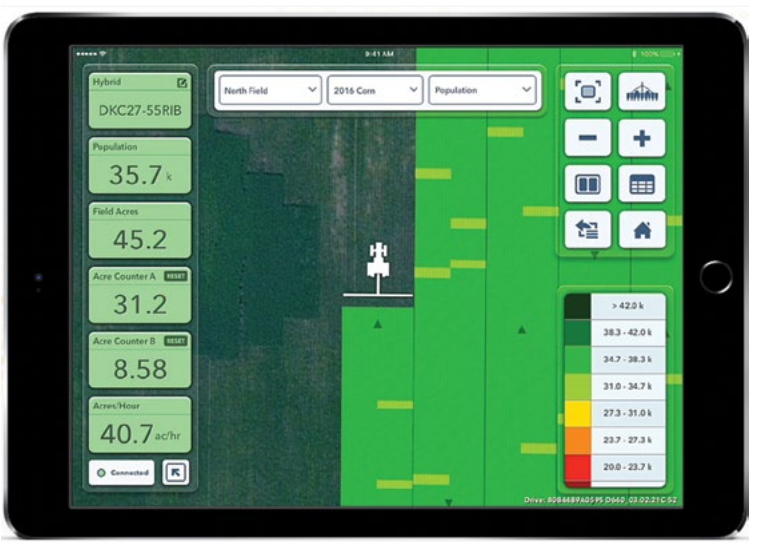

Photo: climatefieldview.ca/features/get-your-data-in-one-place

CHUCK FOSSAY
STARBUCK, MANITOBA

Chuck Fossay tests canola hybrids by seeding a few strips of a new hybrid in the middle of a field seeded to his old hybrid. Strips are 120 feet wide – up and back with the drill – and the full length of the field. "That gives us a side by side comparison with all the same management," Fossay says.

He also works with a corn seed company to run hybrid trials on the farm. These trials are done in the middle of Fossay's own corn fields, so they get the same fertilizer package and the same growing conditions as the field itself. These trials could be done with any crop, providing a good on-farm comparison of performance.

For pesticides, he'll usually try new products on a smaller field and then compare results to un-sprayed fields or fields sprayed with his current favourite.

"For seed and pesticides, people tend to be more willing to change because they can run small tests without much of an investment," Fossay says. "If they like it, they can scale into full production."

It's different, he says, with new machinery. "If I'm adopting a new piece of seeding equipment and spending $400,000 or $500,000, I want to try it out first," he says. "So I'll borrow or rent one to try for a day."

"Everybody has their own way of approaching new technology or products. I've heard that 60 or 70 per cent of people don't make a decision until they've see how the early adopters do, and I'd put myself in that large group."

–Chuck Fossay

Before that day, he will have researched technical information online, asked dealers about the tool and checked with neighbours who have tried it. "I look for trustworthy sources and a range of opinions," he says.

Fossay doesn't consider himself an early adopter. "Everybody has their own way of approaching new technology or products. I've heard that 60 or 70 per cent of people don't make a decision until they've see how the early adopters do, and I'd put myself in that large group," Fossay says. "Once we have done our research, it might take a couple of months to make the decision to switch, or it might take a couple or three years, especially on our farm." "We usually start small and work our way up."

–Jay Whetter is the editor of Canola Digest.

Photo: canolacouncil.org/canola-watch/2015/07/22/how-to-do-a-correct-strip-trial

Quick tips for on-farm trials

On-farm research can be a powerful tool to test new products or practices under the conditions specific to any one farm or area.

Plan the location of check strips. Think about the products you want to test and plan where you'll run the trials. Put strips of treated versus untreated crop in a uniform part of the field. If a uniform area is not possible, choose an area of the field that reflects the field as a whole.

Replicate the strips. Try a few untreated and treated strips in the same block (four strips of each are ideal), in different areas of the farm and, ideally, in different years. This increases the confidence that differences (if any) are the result of the treatments, and not because of chance variation caused by differences in weather, soil and other factors.

Control other variables. If comparing a fungicide, for example, make sure the treated and untreated strips are the same variety, seeded the same day with the same tool, and follow the same practices for fertilizer, weed control and harvest. For a fertilizer trial, have detailed soil sample results for the treatment area. This will account for different yields that may result from natural variation. This natural variation is another reason why multiple strips within a relatively uniform part of the field are important. Another quick tip: if applying any type of spray to a test area, spray perpendicular to the direction of seeding to ensure the same amount of wheel tracks run through each strip.

Weigh the results. Harvest all treatments on the same day. Ideally, the strips will be wider than the swather or combine header so the combine can cut through the middle of each strip to avoid edge effects. Combine each row separately and use a weigh wagon to get the most accurate yield data for each strip. Measure the exact length and width of the strips. Make sure the hopper is emptied before starting a new strip.

Keep notes. Record weather conditions, soil moisture, seeding date, pest pressures, harvest date, harvest quality and anything else you can think of. That will help create scenarios where a product may or may not work.

This is a brief overview of the protocols for on-farm trials. For more detailed tips, please go to **canolacouncil.org/research**.

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Fertilizer rates based on soil sampling is a basic part of 4R nutrient management. This article explains how Federated Co-op 4R designated agronomists can help a farm allocate fertilizer resources based on the productivity of each field or zones within each field.

SOIL SAMPLING AS STEP TOWARD IMPROVED LAND USE

BY JAY WHETTER

Dean Nelson has areas within fields that he knows should be treated differently when it comes to fertilizer management. Nelson from Wetaskiwin, Alberta has been farming since 1996 and he always keeps records of fertilizer rates.

"I'm always taking soil samples, and then putting on the right rate of fertilizer for each field," Nelson says. "This has saved me a lot of money over the years."

But he sees potential in taking this to another level. He has fields with black soils, sandy soils and areas with solonetzic hardpan just below the soil surface. These field characteristics can mean fairly high variability in yield potential and fertilizer return on investment, especially the solonetzic areas that limit water infiltration and tend to be higher in salinity.

Nelson is not set up for automated variable-rate application of nutrients, but he will look at low-tech methods to provide special treatment for these zones.

"I want to sample the solonetzic areas separately, and compare them to the rest of the field, checking for variances," he says. With that information, he could manually cut fertilizer applications to those larger areas or target them for manure to improve soil quality.

Moving toward fertilizer rates adjusted for in-field variability represents the second tier of 4R nutrient management, which is a central part of Nelson's field management plan. In fact, Nelson works through his local Federated Co-op Agro Centre to have his acres counted under Fertilizer Canada's 4R Nutrient Stewardship program. (See the sidebar.)

Nelson started this back when Wetaskiwin Co-op was owned by Parkland Fertilizers. Parkland offered a program for its farmers as a way to recognize their sustainability practices. Farmers could then use this label when selling to end users. "As farmers, we were doing everything right but weren't being recognized for it, so I signed up," Nelson says. "I felt that if the program could help customers recognize that farmers are doing the right thing, it would help agriculture in the long run."

When Co-op took over the Wetaskiwin location, it was a relatively easy step for Nelson to transfer over to Co-op's own "Grown with Purpose" program. Co-op started Grown with Purpose in 2019 to demonstrate the good news story of agriculture throughout its value chain. Co-op is aligned with Fertilizer Canada's 4R Nutrient Stewardship program.

Robyn Gerrard, an agronomist at Wetaskiwin Co-op, has the 4R designation, which allows her to work with farmers to have their acres recognized as 4R. "All of the agronomists in our office have the designation, and I think most agronomists who work for Federated Co-op have it," she says.

She has no trouble getting farm acres signed up under the program. "Farmers in this area are modern and up-to-date, so the basic principles of 4R – minimum tillage, soil sampling and using new more efficient fertilizer sources – are already widely accepted," Gerrard says.

Nelson is one of her farmers. He says it takes a five- to 10-minute conversation with Gerrard to get signed up each year. The process is simple because, as he says, he uses minimum tillage, he soil tests every year, and he uses a different blend for each field.

While there's no premium price for those who participate – "I haven't seen any price benefit for it," Nelson says – having acres recognized as 4R has other benefits.

"It can improve your personal brand," Gerrard says. For one thing, this can make it easier to negotiation land rental agreements. "Being able to show the landlord that you're taking good care of the land is important, especially in the Wetaskiwin area."

Working with Gerrard to stay on top of 4R practices can also improve Nelson's fertilizer return on investment. He gives the specific example of soil sampling after a recent drought year. "My soil samples showed more nutrients left in the soil than I expected, so I reduced my fertilizer rates by half the following year."

Overall, Nelson says following 4R practices, having regular 4R conversations with Gerrard and then seeing his acres recognized as 4R are all worthwhile steps. "It's good to try and improve my farm to the best of my ability. We don't always do the best, but we learn from our mistakes and go forward."

–Jay Whetter is the editor of Canola Digest.

Dean Nelson works through his local Federated Co-op Agro Centre to have his acres counted under Fertilizer Canada's 4R Nutrient Stewardship program.

"Being able to show the landlord that you're taking good care of the land is important, especially in the Wetaskiwin area."

–Robyn Gerrard

Two quiz questions on soil sampling

The Canola Watch agronomy quiz for October 7, 2020 had these two questions:

1. Roughly how much will it cost per field to (1) hire someone to collect a composite sample in two parts (0-6″ and 6-24″) and (2) get a lab analysis on that two-part soil sample?

A. Around $50
B. $100 to $200
C. $300 to $400
D. Around $500

2. The Saskatchewan Crop Planning Guide for 2020 has estimates for input costs. For the Black Soil Zone, the guide uses a base canola yield of 53.8 bu./ac. and estimates fertilizer costs per acre based on nutrient removal for that crop. What does the guide suggest will be the total fertilizer cost per acre for this canola yield?

A. $68
B. $81
C. $93
D. $117

Answers: 1 (B) and 2 (C). A soil test cost of $1 (or less) per acre makes a lot of sense if it helps make better decisions on a fertilizer bill of $93 (or so) per acre.

See this quiz and others at **canolawatch.org**. While there, sign up to receive agronomy updates (including the quick agronomy quizzes) through the year.

For tips on soil sampling and fertilizer rates for canola, see the Fertility section at **canolaencyclopedia.ca**.

How to get your 4R acres counted

What is 4R? 4R Nutrient Stewardship is a Fertilizer Canada framework encouraging growers to use the four 'Rights': Right Source @ the Right Rate, Right Time, Right Place. The goal of the 4R designation program is to help crop producers minimize environmental concerns related to agriculture while maximizing economic benefits. The principle is simple, provide the right source of nutrients at the rate, time and place that will minimize the losses of nutrients and maximize the crops access to the nutrients.

Why does it matter? Canada's canola industry sees a lot of potential for 4R Nutrient Stewardship for land enhancements, profitability improvements and proactively showing our customers and their governments how we're taking sustainability seriously. As a result, Canada's canola industry has a goal to utilize 4R Nutrient Stewardship practices on 90 per cent of canola acres by 2025.

How to get your 4R acres counted? To become a part of the 4R program, farmers have to work with a 4R designated agronomist. The agronomist helps the farmer construct a specific 4R nutrient management plan to help ensure your acres can be considered 4R. Once farmers have taken the steps required to complete a 4R Plan, the 4R designated agronomist compile all 4R acres, on a crop and location basis, and submits these acres to Fertilizer Canada. Fertilizer Canada never sees individual plans developed as that stays between the agronomist and their farmer customer – all Fertilizer Canada sees is a total number of crops by location and crop. (A farmer cannot get a designation on their own.) There will be increasing demand for 4R designated agronomists to meet industry goals, and provide this service for their customers. Ask your local retailer about the designation program today.

What's in it for the farmer? Two things. First, fertilizer is the biggest expense in canola production. Through the use of 4R Nutrient Stewardship, farmers can ensure they use fertilizer efficiently and get more return from the investment. Second, end users and regulators are paying more attention to crop production practices such as how fertilizer is utilized, especially escapes to the atmosphere and runoff into waterways. Losses to the environment are monitored and could lead to regulations. 4R Designation demonstrates that farmers have the same cares and concerns as other members of society.

For more information, see the Fertilizer Canada resources at **fertilizercanada.ca/nutrient-stewardship/4r-designation** or talk to a **CCC** agronomy specialist.

Photo: iStock.com/HappyNati

Responsible Grain is seeking farmer feedback on a draft code of practice for Canada's grain industry. To sign up for online consultation, visit **responsiblegrain.ca** or email info@responsiblegrain.ca.

Help shape the grain and oilseed code of practice

For the past year, the Canadian Roundtable for Sustainable Crops has been developing a voluntary code of practice for Canada's grain industry, called Responsible Grain. The process has brought together stakeholders from across Canada, including farmers, agronomists, commodity organizations and industry representatives. Consultations on the draft code are taking place now through February so there is a limited time to get involved.

"It's prudent for farmers to get involved in the consultation process so they can shape the final version of the code," says Cheryl Mayer, director of policy development at Canadian Canola Growers Association. "The consultation seeks to find out how the practices outlined in Responsible Grain will work on many different farms across Canada." The consultation is also seeking input from other members in the grain supply chain, including grain handlers, processors and consumers.

Responsible Grain is a voluntary, science-based code of practice, which outlines both required and recommended on-farm management practices that show Canadian grain farmers' care and commitment to the environment and sustainability. It is a baseline of modern agronomic practices to maintain healthy soil, clean air and water, respect wildlife and provide a safe work environment on Canadian farms. The code includes seven separate modules and addresses various management areas, including nutrient management, pest and pesticide management, soil and water management, land use and wildlife, and human health and wellness.

"Responsible Grain has been proactively developed in response to an increasing demand for information about sustainable production practices," says Taryn Dickson, Canola Council of Canada resource manager, crop production and innovation. "It builds upon our existing reputation for quality and can help build public trust in Canadian-grown crops, both at home and abroad, by expanding our ability to share our sustainability story."

A recent 2020 public trust study published by the Canadian Centre for Food Integrity found that when it comes to Canadian consumers "sustainability in food is not just a trend but a requirement to be a trusted and successful food system player." The study found that 47 per cent of consumers say they actively seek out food items that have a minimal environmental impact, and 45 per cent of consumers believe that sustainable food has a positive impact on the environment.

Farmers who want to learn more about Responsible Grain and participate in the consultation can do so without leaving the farm. The virtual consultation includes three components: (1) a 60-minute orientation and feedback session (Online orientation sessions, which will cover why the code was developed and what it is intended to do, are January 7, January 14 and January 21), (2) an online work space where participants can work through one or all seven of the code of practice modules and submit their comments, and (3) a final virtual wrap-up session.

To learn more about Responsible Grain, check out the website at **responsiblegrain.ca** and follow them on Twitter at @RespGrain.

To participate in the consultation, you can sign up at **responsiblegrain.ca** or email **info@responsiblegrain.ca**.

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AGRONOMY INSIGHTS

Tips and tools from the Canola Council of Canada agronomy team

WHAT FACTORS KEPT A LID ON CANOLA YIELDS IN 2020?

Canola yields in Canada were "average" in 2020. Buried within this "average" is good news out of southern Alberta where farmers had their best year in a long time. In many other areas, fields were looking good in June but then fizzled to average by September. Most farmers were probably satisfied with the result, especially since it came with a relatively smooth harvest – at least compared to 2019. But yields can always be better, especially since averages are still 10 bu./ac. below the 2025 canola industry target of 52 bu./ac.

This article looks at major yield robbing factors in 2020.

HEAT HURT SEED SET

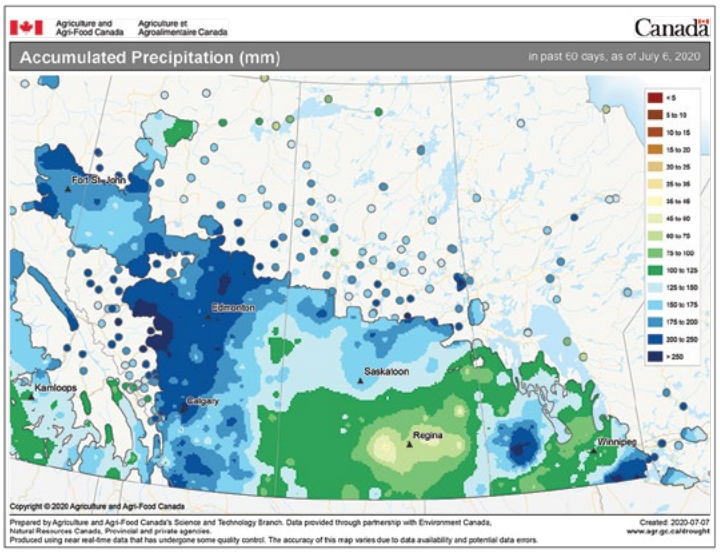
Hotter than average July temperatures, especially in Manitoba and Saskatchewan, hit canola right at flowering – which is the worst time for a heatwave. Historically, canola yields are lower in warm years and higher in cool years. Heat at flowering damages pollination and reduces seed formation, resulting in high levels of missing or empty pods. Canola will flower longer to compensate, but it can never make up for lost yield from heat during the first two weeks of flowering.

CCC agronomy tips: A uniform crop seeded within the first two weeks of May has a better chance of flowering ahead of the hottest days of summer. The Canola Council of Canada (CCC) agronomy specialists recognize some of the risk and challenges with early seeding, so encourage seeding based on soil temperature, soil moisture and weather forecast to hopefully achieve more rapid emergence. Selecting hybrids that are best suited to a farm's particular environment is also important. Farms in areas where July highs and lows are hotter than in other parts of the Prairies may want to ask seed companies about hybrids with higher heat tolerance and seek early maturing varieties that tend to also flower a little earlier. Finally, the message of balanced fertility can reduce susceptibility to stress.

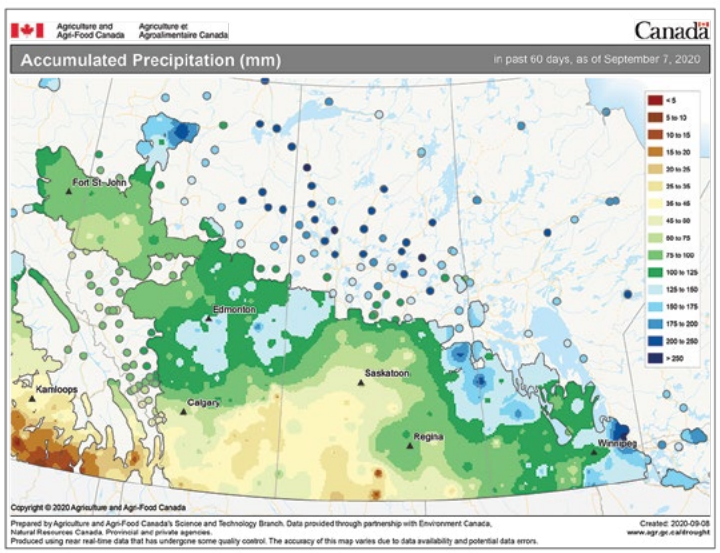
WET-THEN-DRY MEANS ROOTS NOT THERE WHEN NEEDED

When the year starts off with ample soil moisture, roots may not grow as deep. Then if rains stop part way through the season, which is what happened in 2020, plants tend to put more energy into root growth to access moisture reserves lower in the canopy, which means less energy for seed production.

CCC agronomy tips: Stand establishment is all about getting plants out of the ground and photosynthesizing. Emergence was good for the most part in 2020, compared to previous years, but when weather turns dry, the key message is to make sure any further inputs are assessed more rigorously. This is all about scouting and making decisions on a field by field basis based on the likelihood of economic return.



This map shows rainfall accumulation across the Prairies for the 60 days leading up to July 6.



This map shows how the season changed. This is rainfall accumulation across the Prairies for the 60 days leading up to September 7.

SOGGY, FLOODED FIELDS

The season started with ample soil moisture. Snow and rain that delayed harvest in the fall of 2019 meant that soil moisture heading into 2020 was high for many areas of the Prairies. This was good for the most part, but created particular challenges for two important canola-growing areas. (1) Precipitation in fall 2019 meant that large areas of the Peace still had crop to harvest in spring 2020. (2) Areas in north central Alberta and northwest Saskatchewan had field access issues due to spring moisture. Both factors slowed seeding progress.

As the weeks went by and rains continued, it became too much for some areas in central Alberta. By early July, the accumulation of water left crops drowned and dead on John Guelly's farm at Westlock.

By the third week of May, Alberta seeding progress was 19 per cent behind the normals, while farmers in southern Alberta, Manitoba and Saskatchewan farmers were seeding at a "normal" pace, on average.

CCC agronomy tips: Agronomically, there is not much to do for fields that are too wet to seed or that get drowned out due to moisture. The message at that point is about planning for next year, which includes soil tests to account for nutrient reserves that will be difficult to predict. Water flowing across the land can also move clubroot spores, so consideration for clubroot management will remain a priority.

WIND BLOWS AND GUSTS AND GALES

Quantifying a yield effect from wind can be difficult, but day after day of wind delayed in-crop herbicide applications for many farms. Environment and Climate Change Canada says it was the windiest mid-May to mid-June over the past 30 years, based on data for Winnipeg airport. These high winds were widespread across the continental midwest and returned in August.

For many fields, spraying delays allowed weeds to grow bigger than farmers would normally allow. These weeds took up nutrients and provided some level of crop competition. Weed control that is delayed until after the four-leaf stage of the crop has been shown in many studies to cause yield loss.

Wind at harvest also rolled swaths and caused pod drop and wind-shatter losses for standing crop. While yield loss will have happened on damaged fields, we don't have an estimate of how much.

CCC agronomy tips: Find scouting tips for flea beetles that take shelter on stems, as well as "Tips on how to spray in the wind" and "Can I spray at night when winds are more calm?" Search for those articles at **canolawatch.org**.

FLEA BEETLES DOWN BUT NOT OUT

Insects were not a major problem in 2020, except maybe for flea beetles – but even they were not near as bad in 2020 as they were in 2019. However cooler spring temperatures meant that slow emergence left plants more vulnerable. Flea beetles can quickly set back the crop and increase yield loss potential. CCC agronomy specialist Keith Gabert surveyed 31 farmers and agronomists from across the Prairies, and half of them said flea beetle pressure in 2020 was high to very high. For those fields with heavier flea beetle damage, yield loss was estimated at eight per cent, on average.

Wind blows pods from standing canola.

Gabert also discussed insect pressures and management strategies at the Western Forum on Pest Management (WFPM), which he chairs. In October each year, WFPM offers a first opportunity for government and industry researchers, regulators, extension and agronomy staff to summarize the season's insect and disease results and challenges before entering into a winter extension and planning season.

CCC agronomy tips: Given that flea beetles are a problem somewhere in most years, the CCC shares comprehensive information on how to assess fields and make flea beetle spray decisions based on economic thresholds. Search for "flea beetles" at **canolawatch.org** or in the insects chapter of **canolaencyclopedia.ca**.

DISEASE FACTORS

CCC agronomy director Clint Jurke says sclerotinia stem rot would have been a much larger issue in northwest Saskatchewan if not for most acres being sprayed. He reports that a few unsprayed fields in this region had incidence at 50 per cent, while those sprayed were mostly less than five per cent. Warm, moist soil temperatures in parts of the Prairies in spring may have contributed to an increase in foot and stem rots caused by *fusarium* and *rhizoctonia*. Other notable disease factors were a rebound in blackleg incidence in Manitoba after a drop in 2019, and verticillium stripe. The relatively new disease was seen in more areas across the Prairies and may have caused yield loss. (We're waiting on research to help quantify verticillium stripe losses.) Verticillium likes warm, dry conditions, and tends to be most obvious right at harvest – so the disease had about two months of ideal conditions to take hold.

CCC agronomy tips: Crop rotation remains the key message for management of blackleg, clubroot and verticillium stripe – which is soil-borne, like clubroot. Look for more on verticillium stripe at canolaencyclopedia.ca and the article "How to identify verticillium stripe" at **canolawatch.org**. Spraying for sclerotinia stem rot is always a difficult decision for farmers, but Jurke says that growers and agronomists are doing a good job following CCC recommendations on how to make the spray decision and ideal timing on when to spray.


Photo: Justine Cornelsen

Using research to prepare for a canola disease threat

Verticillium stripe disease has flown under the radar due to misdiagnosis, limited survey results and a lack of quantification of its impact on Western Canadian canola crops. New research projects underway will enhance our understanding.

Characteristic striping symptom on canola stem infected by verticillium stripe

BY TARYN DICKSON

The Canadian Food Inspection Agency (CFIA) confirmed that the observation of *Verticillium longisporum* in a Manitoban canola field in 2014 was the first presence of this pathogen in any Canadian field crop. The following year a survey found it in five more provinces. Disease symptoms were noticed in 2018 and 2019 crop years, and this past growing season some yield losses were actually attributed to the disease.

Although the vascular disease was initially referred to as "verticillium wilt", the name has been changed to "verticillium stripe" to more accurately describe the stem striping symptom caused by the soil-borne fungus. (This symptom is often accompanied by the presence of microsclerotia and peeling back of the epidermal layer.)

The disease of Brassica plants has led to devastating crop losses in Europe, but still has many information gaps in Canada. Verticillium stripe has been recognized as an emerging pest of concern by the canola industry, and has been named a crop production research priority by the Canola Council of Canada (CCC). To better understand this disease, three research projects – which can be found on the Canola Research Hub at **canolaresearch.ca** – have been launched via the Canola Agronomic Research Program (CARP) and the Canadian Agricultural Partnership (CAP) program, both which are administered by the CCC. Agriculture and Agri-Food Canada (AAFC) and the CCC provide funding for CAP projects, and Alberta Canola, SaskCanola and Manitoba Canola Growers provide funding for both programs.

A four-year 'Verticillium Stripe Management' project is underway through CARP. While final results won't be available until 2023, the first field trial and three greenhouse experiments have already been completed.

These and the future experiments/trials are aimed at:

- Examining the relative virulence of *V. longisporum* and *V. dahliae* on commercial canola cultivars.
- Determining the effects of growth stage and inoculation techniques on infection.
- Evaluating the effects of disease severity on plant growth and yield at different inoculum concentrations.

Two verticillium CAP projects are scheduled to wrap up in 2023. The objectives of the 'Verticillium disease etiology and nursery' project, led by Dilantha Fernando at the University of Manitoba, are to:

- Further develop tools for rapid identification of the pathogen in soil.
- Understand the longevity of the pathogen and microsclerotia in soil.
- Establish the endophytic nature of the pathogen in soil.
- Measure the diversity of *V. longisporum* and its lineage.
- Determine and quantify the relationship and interaction between *V. longisporum* and *L. maculans*.
- Develop and utilize a verticillium nursery to provide source materials.
- Understand the yield risk of *V. longisporum*.

The 'Genetics and genomics of Brassica-Verticillium interaction' project, led by Hossein Borhan at the AAFC station in Saskatoon, is focussed on:

- Identifying resistance against verticillium in Brassica germplasm.
- Understanding genome organization of Canadian isolates of the *V. longisporum* pathogen.
- Understanding the biology of *V. longisporum* virulence and identifying virulence factors in the *V. longisporum* genome that are vital to colonization of the host.
- Gaining insight into the molecular interaction between *V. longisporum* and *B. napus*

In addition, the CCC is leading efforts to help the industry to finalize a disease severity scale and continues to support the monitoring of the disease spread and levels of infection through surveys.

Continue to check the for progress updates on these research projects, as well as updates on other important topics related to canola production at **canolaresearch.ca**.

–Taryn Dickson is resource manager, crop production and innovation, with the Canola Council of Canada.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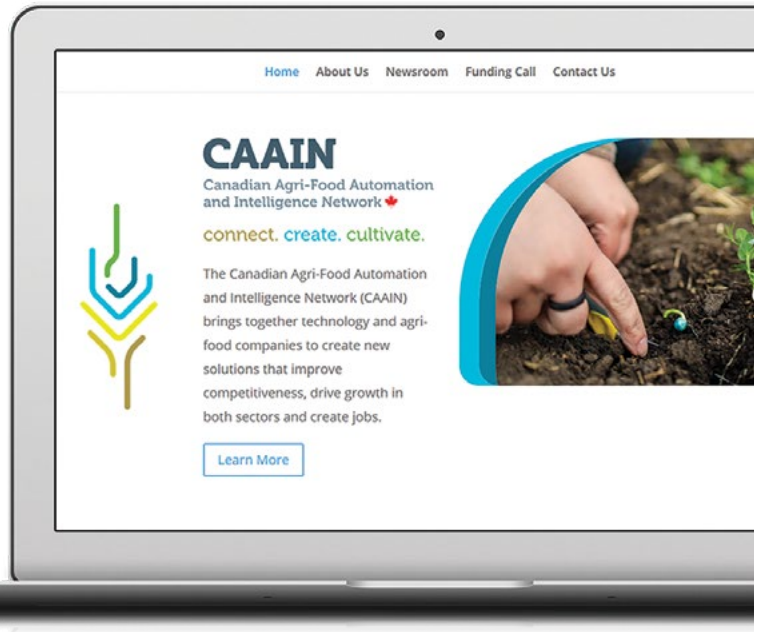
The new Canadian Agri-Food Automation and Intelligence Network (CAAIN), which includes the smart farms at Olds College and Lakeland College, will help innovators make the connections necessary to test an idea and bring it to market.

CANADA INCUBATES A NEW WAVE OF AG TOOLS



What innovations do we need to produce crops more profitably and with a smaller footprint?

If you have an idea, the new Canadian Agri-Food Automation and Intelligence Network (CAAIN) is designed to make the connections necessary to test that idea, provide support for research and development, and even help to bring some of these ideas to market.

"Crop production is very dependent on labour and weather," says Cornelia Kreplin, interim CEO for CAAIN. "Just think of the possibilities for agriculture if we had harvest machines that could continue 24/7 when conditions are good or drones that can spray at the optimal window."

CAAIN's purpose is to encourage new ideas and then provide connections and some funding to test these ideas.

Kreplin is based in Alberta and also works for Alberta Innovates, the organization that led the application to create CAAIN.

CAAIN launched in July 2019 with funding from the Government of Canada's Strategic Innovation Fund. CAAIN's core partners are Alberta Innovates, Olds College, Lakeland College and a few private companies. In October 2020, CAAIN put out a call for proposals with a focus on projects that provide solutions through automation and digital technology. Researchers from universities or not-for-profit organizations can apply, and projects require at least two small and medium-sized enterprise (SME) partners.

Through CAAIN, these SMEs and other project partners can be reimbursed up to 40 per cent of the cost of developing automation or technology solutions that will help any user make better farming decisions.

"If a company is not prepared to write research applications, CAAIN can help them," Kreplin says.

Smart farms at Lakeland and Olds colleges are important partners. "These farms are designed to accelerate adoption, test the return on investment for new technology, and then demonstrate this new technology to the surrounding community," Kreplin says.

Joy Agnew is associate vice president with the Olds College Centre for Innovation. "Since we launched the Smart Farm in 2018, Olds College has received unprecedented interest from traditional and nontraditional ag companies who see significant value in the ag-tech space," says Agnew.

Olds College is the lead for three submissions to the CAAIN program. One submission will compare labour efficiency and field efficiency for autonomous versus conventional agriculture equipment. Another will assess which field data layers are most critical to determining yield potential. The third is to establish a pan-Canadian smart farm network to demonstrate, evaluate, and disseminate lessons learned about new ag technology.

Olds College is already working on other research and product proof-of-concept projects. These include validation of an on-combine NIR analyzer for real-time grain protein mapping, development and validation of in-bin drying system, and testing and validation of optical spot spray technology for western Canadian conditions.

With Smart Farms just getting started and new rounds of funding to incubate and commercialize new ideas, it could bring a new wave of innovation to Canadian agriculture. Farmers who have ideas or who want to see new ideas in action can connect with CAAIN at **caain.ca**.

"These farms are designed to accelerate adoption, test the return on investment for new technology, and then demonstrate this new technology to the surrounding community."

–Cornelia Kreplin

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One small change can have long-term farm savings

Little things that seem like nothing can add up to a surprising amount of wasted money and time. The concept of "Lean" farming can help you recognize waste so you have more time for practices that add true value.

BY JESSIKA GUSE

The saying, time is money and money is time, holds true in farming and all walks of life. However, if you could spend an hour of your time to save just $10, would you?

Ten dollars to most is pocket change, and you can probably think of better returns for that hour – like getting a tractor to the second yard so an employee can complete some of his weekly tasks. But what if that one hour you spent, for example, cleaning up the shop, saved you from buying new light bulbs because you found a stash that dropped behind the mini fridge, and on top of that, you finally got around to changing out the dead bulbs instead of relying on the dimly lit fluorescent bulb in the corner like you have been since seeding? That hour of clean up and $10 in found bulbs is starting to have a ripple effect.

This is all part of the thinking that surrounds "Lean" farming. Ove Karlsson, project leader in agriculture economics at the Swedish University of Agricultural Sciences SLU Centre for Agricultural Business Management, explains how Lean farming can save both time and money in the long run.

"Lean is a philosophy that helps you to continuously improve your business," Karlsson says. "You reduce the waste and you focus much more on the thing that provides value creation."

When you look at the way farms operate, very few run the same way due to factors like family dynamics, size of the farm, and procedures and practices that have been passed down from generation to generation. However, all farmers can benefit from the Lean 5S's no matter their size, shape or age.

THE 5S'S OF LEAN

The first three actions are the easiest, according to Karlsson. They are Sort, Set in place and Shine.

To implement these three actions, Karlsson suggests you take a good look at your workstations, whether it be in the cab, shop, quonset or the office, and clean them up. Put things back in the right spot, clear it of unnecessary papers and tools, and then make it a habit to keep these stations tidy going forward.

Sure, this might take some time that could be used to do other things, but for the hour or so it would take, it sure beats the amount of frustration and time you'll spend in the future looking for that 9/16th wrench that's been hiding under old auction papers.

The fourth S action is to Standardize. By this, Karlsson says it's imperative to keep the structure and good practices in place for both full and part time workers along with seasonal, and family members that help out here and there.

This could be anything from a checklist for staff to complete after each shift to minimize workplace injuries, regular and consistent meetings to check in on everyone's mental health, or even picture examples for how you, as the farm boss, would like workers to keep their cab during harvest. (Pictures can show no garbage, extra water bottles, fire extinguisher, etc.)

Lastly, the fifth action is Sustain. Keep the four S's as a continuous habit, and also take a step back from time to time, and re-evaluate the way you do things.

"A lot of times, the farm boss just does what they have always done, but they have never really analyzed what they've done and why they're doing it," Karlsson says, referring to the fact some people have the mentality of, "we've always done it that way, so why change it".

However, he says that's not the Lean way of thinking. There has to be a commitment by both the leader and their employees to be willing to change to improve the operation in the long run.

"That's why we say that Lean is a commitment involving all the employees," Karlsson says. "A lot of employees might see that there are some wastes – either in time, product or money – but nobody has asked about them."

AN ALBERTA FARMER'S EXPERIENCE WITH LEAN

Alberta Canola director and mixed operation producer Cale Staden worked directly with Karlsson during one of the sessions within the Canadian Total Excellence in Agricultural Management (CTEAM) program.

"I think if you're willing to, it's possible for anybody to implement the Lean way of thinking, I really do," Staden

"I mean, it's not a ton of money, but it's still money. For example, if we spend $20,000 a year on maintenance, and you can save 30 per cent of a portion of that — it's money in our pocket. So why wouldn't you?"

–Cale Staden

"That's why we say that Lean is a commitment involving all the employees. A lot of employees might see that there are some wastes – either in time, product or money – but nobody has asked about them."

–Ove Karlsson

says. "I think everybody can benefit from it in one way or another."

He brought back what he learned from Karlsson to his dad and brother, who he farms with. At first he thought the results might be small, but the approach has led to significant changes to the farm that he can see having a long term benefit.

This is not only the 5S's, but also the "waste glasses" exercise — where one takes a step back and looks to see where time, money and resources are being wasted.

For example, when it comes to oil filters for machinery, Staden chuckled a bit while explaining they know it's something they use year after year on more than one occasion. Yet somehow, they could never find the sticky note or piece of cardboard they scribbled on with what filter tractor number four took. Nor could they find the filters they've bought in the past, or even worse, the store would be out of the certain kind they needed. Staden also pointed out that they knew oil filters went on sale *every single spring*.

The solution? Staden averaged out how many oil filters of each type his farm used on a yearly basis, and then purchased that amount and a few extra in bulk during the spring sale. It saved them 30 per cent, on average.

"I mean, it's not a ton of money, but it's still money," he says. "For example, if we spend $20,000 a year on maintenance, and you can save 30 per cent of a portion of that – it's money in our pocket. So why wouldn't you?"

Along with money, it also saved them running around the different yards and, at times, the raised voices required to get the job done.

At the end of the day, Karlsson says Canadian farmers are already great leaders in working smarter not harder, so if they try to implement Lean into their operation – just imagine the possibilities to where it would take them.

–Jessika Guse is a freelance agriculture journalists based in Calgary, Alberta. Email newswithguse@gmail.com.

We want you to Eat More Meals Together

Canola Eat Well has a new version of its award-winning recipe booklet called *Eat More Meals Together*. The goal is to build a community that shares its kitchen inspirations and to encourage healthy eating using canola oil.

BY LIBBY ROACH AND ELLEN PRUDEN

Did you see your copy of the latest canola oil promotion tool from Canola Eat Well? The *Eat More Meals Together* book, which was included with mailed issues of the January 2021 Canola Digest, provides easy-to-make recipes for families at home, connecting locally grown produce and oil as ingredients you can find in your grocery store. The book is part of a Canola Eat Well program that won a Canadian Agri Marketing Association (CAMA) Best in Show award.

Often the best memories involve two things: food and people. Food is not just an essential part of our day, but essentially the most important part of any occasion. During this unprecedented pandemic, where we're all forced apart, Canadians are catapulted into the kitchen while restaurants operate with limited capacity or none at all. Months later, many of us still left confounded when it comes to cooking.

Tapping into that experience – which professional home economist (PHEc) Jennifer Dyck calls "meal prep fatigue" – is something we all face. What is the cure to this COVID-19 cooking conundrum? "Community." When inspiration doesn't strike, Jennifer Dyck, as a thought leader and agricultural advocate, encourages us to seek reputable resources and familiar faces.

"The annual *Eat More Meals Together* guide is veggie-centric and approachable," Dyck says. "Written by professional home economists, chefs and dietitians, it will inspire you to get back in your kitchen. Recipes have easy substitutions, new takes on basic ingredients and fresh ways to explore the familiar – all while celebrating our Canadian harvest."

We could all use some help, a lift up and some encouragement, now more than ever. Hit the reset button on food anxiety, meal prep fatigue and restore your confidence in the kitchen. Help is in your hands. The *Eat More Meals Together* recipe booklet is just the start.

We also encourage you to join our @CanolaEatWell community on Twitter and Instagram and use the hashtag #makeitcanola.

The Canola Eat Well joint effort is part of the provincial canola organizations' mandates to actively facilitate market development initiatives in Canada. Across the Prairies, market development programming is about maintenance and awareness while a targeted market development program in Ontario is about increasing awareness and demand among consumers in that growth market.

–Ellen Pruden is the Canola Eat Well director for Manitoba Canola Growers. Find out more at canolaeatwell.com. Libby Roach is a food editor at auburnlane.com and photographer based out of Toronto. Her creative passion lies in weaving stories into photographs and creating images that are engaging. Libby attended Canola Harvest Camp in 2018 and you will want to follow her on the Instagram @cookiespi.

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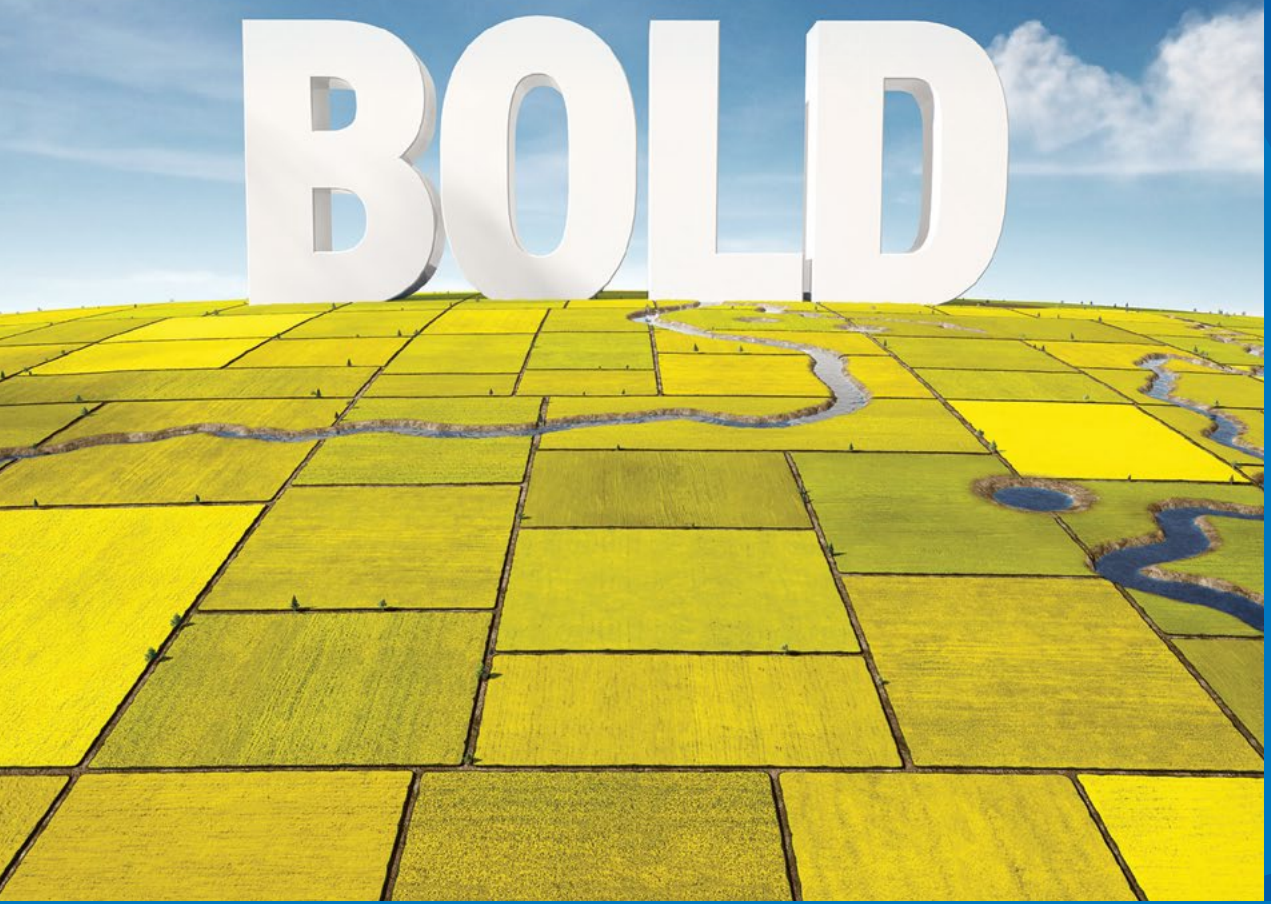

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