

Survey finds on-farm cover crop innovation occurring across the Canadian Prairies

Researchers at the University of Manitoba (UM) have shared the results from the 2020 Prairie Cover Crop Survey which capture a snapshot of the use and grower observations of this new practice. The report suggests that cover crops are becoming established in the Prairies and can be grown in a wide range of locations and environments across Manitoba, Saskatchewan and Alberta.

Accessing local information about cover crops has been a hurdle for Prairie farmers interested in adopting this production method which holds the potential to build soil health and store carbon in soils.

To help fill these knowledge gaps the 2020 Prairie Cover Crop Survey was developed to provide information to farmers, agronomists, researchers, policy makers, and government organizations that will play an important role in the future of cover crops in the region.

Between October 2020 and April 2021, Dr. Yvonne Lawley and graduate student Callum Morrison from the Department of Plant Science at UM asked farmers questions about how their farm utilized cover crops in 2020, such as how cover crops were grown, their agronomy, the benefits and the problems farmers have experienced. Respondents were also asked about what could be done to support those using cover crops as well as questions to characterize farm types and size.

"It is an important time to hear from farmers about their needs for research and knowledge transfer," said Callum Morrison. "Farmers want to know how to use cover crops to meet their goals. Policy makers and extension providers want information to best assist farmers and design policy to reach environmental targets."

In total, the survey collected responses from 281 early adopters who grew a cover crop in 2020. These farms, which were from every major agricultural region of the Prairies, grew 102,539 acres of cover crops. Of the respondents, 31% were from Alberta, 32% from Saskatchewan and 37% from Manitoba.

"As early adopters of cover cropping on the Prairies, we've found it to be a bit of a lonely pursuit," said Kevin Nickle, survey respondent and grain farmer in the Red River Valley of Manitoba. "This survey demonstrates that there is widespread participation and a general desire to continue. There is so much to learn in this realm and this survey may help inform researchers and practitioners on the specific questions to ask."

"Although I had not yet used cover crops at the time of this study, I am encouraged by the uptake of the practice, and have now planted fall rye as a trial on some of our acres and may be used for spring graz-



University of Manitoba graduate student Callum Morrison.

ing. We are also able to purchase a no-till drill this fall and look forward to the possibilities," said a survey respondent.

The research team partnered with a number of farm organizations and individuals in sharing the survey widely.

"We must thank all those who took the time to call their neighbour, send an email, add the survey notice a newsletter, published a story, or retweeted a post," said Yvonne Lawley. "It was exciting to experience the strength of networks in the agri-

cultural community throughout this project."

Funding for this project was provided by General Mills and Manitoba Agriculture and Resource Development through the Manitoba Ag Action Program.

The report can be accessed at the University of Manitoba Agriculture & Food Knowledge Exchange website: <https://umanitoba.ca/agricultural-food-sciences/make/make-ag-food-resources#cover-crops>.

What are cover crops?

A cover crop is grown to cover the soil, at times when the soil would otherwise be left bare. This mimics natural ecosystems that which have plants continuously growing when the ground is not frozen. For this research focused on the Canadian Prairies, we defined a cover crop as a crop that is planted primarily to provide soil health and other agronomic benefits that is not harvested as a major cash crop. Cover crops that are grazed as annual forage were counted as a cover crop in our definition.

Cover crops take two main forms in the Canadian Prairies. The first being grown to provide cover during the shoulder season between cash crop harvest and the planting of the next cash crop. These cover crops are commonly seeded after cash crop harvest in the fall. However, they may also be established as an intercrop at any time during the lifecycle of the cash crop. Cover crops can also take the form of a full season cover crop, where a cover crop is grown to provide soil cover over a full growing season, either in the place of a cash crop, or in between rows of perennial crops. Farmers may grow a full season cover crop after an extreme weather event has destroyed a cash crop, to manage problem soils (such as salinity), to replace summer fallow, for green manure, or as an annual forage source in a grazing system.

Why are cover crops important?

Maintaining groundcover year-round provides greater protection from soil and wind erosion and provides food for soil microbes during periods when they may otherwise have been left 'hungry'. Plants capture solar energy and fix carbon from the atmosphere that can be returned to the soil, building soil organic matter. This increase in soil organic matter alongside the presence of cover crop roots can assist in the building of stable soil aggregates and increase soil structure and water infiltration.

It is hypothesized that cover crops could play a role in increasing the profitability and resiliency of Prairie farms by increasing yield, nutrient cycling, and water use efficiency. Cover crops may also play a role in nutrient management by reducing fertilizer costs when using legumes that fix nitrogen, or by growing cover crops that can scavenge excess nitrogen left in the soil after cash crop harvest that may otherwise be lost. Cover crops may also provide another 'tool' for tackling weed, pest, and disease pressures, especially at a time of increasing resistance to crop control products.

Continued on page B5 ^{€37}

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APAS launches task force to prepare for Federal-Provincial Agricultural Policy Framework

RM of Moosomin's Trevor Green part of Next Policy Framework task force

The Agricultural Producers Association of Saskatchewan (APAS) has created a task force to prepare its recommendations for the federal and provincial government's Next Policy Framework (NPF).

The NPF consultations will result in a new five-year federal-provincial agricultural funding agreement, which will begin in 2023.

The provincial and federal governments are expected to finalize a shared policy direction statement this fall and begin discussions on the details of the program's design.

"Federal-provincial agreements set out the direction of most of the important government programming for agriculture, and it's time to renew our approach," APAS President Todd Lewis said. "Funding has not changed over the last two agreements, but our agricultural production has increased, and so has our risk."

Lewis explained that risk has increased due to instability in international trade, the Covid-19 pandemic, and widespread drought.

"It's time to update our Business Risk Management programs and make sure we're ready for the future."

The NPF Task Force will consult with producers, other agricultural stakeholders, and government officials and develop priorities for the NPF from its research.

Members of APAS's NPF Task Force are: Chair: Bill Prybylski – APAS Vice-President (RM of Garry #245); Norm Hall – Former APAS President (RM of Emerald #227); Scott Owens – Director of District 6 (RM of Eldon #471); Brent Freedman – APAS Representative (RM of Willow Creek #458); Trevor Green – APAS Representative (RM of Moosomin #121); and Devon Walker - APAS Representative (RM of Wilton #472)

"All the members of this task force have different agricultural backgrounds, are from different regions of the province and together will be able to provide a strong, united, and diverse voice for Saskatchewan producers," Lewis said. "Their perspectives on what needs to be included in the NPF is essential for the sustainability and success of the province's agricultural sector."

The Canadian Agricultural Partnership agreement ends March 31, 2023, and will be replaced with the NPF. Once applications are submitted, the Government of Canada will have one year to determine the funding model of the NPF split between federal, provincial, and territorial governments for Canada's farmers and ranchers.

APAS's submission will highlight the need for Business Risk Management, AgriStability, research investment, trade and market development programs, and

increasing agricultural exports to international markets.

"It's important APAS adds its voice to the NPF because Saskatchewan has an important role to play in the export

growth of the country," Lewis said. "This proposal will outline what Saskatchewan producers see as successes in the current agreement but also ways to improve the new contract for all parties."

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Interview with Sask ag minister: Marit says 2021 shows resilience of farmers

World-Spectator editor Kevin Weedmark spoke with Saskatchewan Agriculture Minister Dave Marit last week about the challenges of agriculture in the province in 2021, and his hopes for the sector looking forward.

Looking back, how would you describe 2021 overall for agriculture in Saskatchewan?

It was a year we definitely don't want to see again and one we haven't seen for decades really, to see this kind of an impact on the ag community, both from the grain side and from the livestock side, and not just in a pocket or in an area, but general and widespread across the province, and across Western Canada. It had a big impact on agriculture and the farming industry and the ranching sector as a whole, but I guess the bright spot of it is that commodity prices are at levels we've never seen before, Kevin.

Were the dry conditions the defining feature of this year?

Yes, and the impact it had on, first and foremost the impact on the livestock sector in trying to access feed. They couldn't even go to Alberta or Northern Saskatchewan or Manitoba or even down into the States to find any—they couldn't. You saw American ranchers coming up and paying high prices for feed in the irrigation districts. Ranchers were looking for alternatives and that's why we came out with the crop insurance program for doubling the write off level so that farmers could make the decision if they felt the crop wasn't worth harvesting that they could at least get some value extracted from it for forage if they were in crop insurance.

With the various programs that came in, the changes that were brought in to deal with the drought, how far do you think those went in helping producers deal with the issues this year?

Actually I think they went a long ways. I have to say from the livestock sector, personally I'm in an area, the Wood River area it's very heavily ranch land and there's a lot of livestock out there and I heard from a lot of my friends that the programs we implemented really saved their operations, both from the crop write off side but also on the livestock payment of \$200 a head on breeding stock.

I had a good, friend he's southwest of Assiniboia and had to go to north of Yorkton to find straw. He personally thanked me, he said 'you've just helped me save my operation and pay my trucking costs.' It's good to hear those kinds of stories and I think that had a huge impact



Saskatchewan Agriculture Minister Dave Marit

on the livestock sector and we didn't see a big run of herd dispersals. We did see some but I think we obviously mitigated a lot of the dispersals.

Are there some solid numbers on how much cattle herds in Saskatchewan were impacted?

We don't have that yet because obviously we're just getting into the fall run now. I know I was at a sale down at Mankota a few weeks ago and the calf prices were still fairly respectable. Most of the guys were pretty happy.

Do you think this will have much of a long term impact on the livestock industry?

I hope not. I farmed all my life too, and we always said well, hopefully it's better next year. I think everybody is saying the same thing.

As we said when you and I talked earlier, everybody's hoping for lots of moisture and some good snow cover so that we can build our reserve moisture back up and fill the sloughs up again. I think that's the biggest concern right now, it's just how we're going to roll through the winter and get into next spring.

What have you learned about agriculture in Saskatchewan from the experience this year?

Well, I think it's something I always knew—we're a hardy group and we're resilient and we always find a way to get things done.

I think I saw that and heard that pretty loud and clear. One thing we did do at the ministry here, which I'm very proud of, is we reached out to stakeholders all through the summer pretty well on a weekly basis—both from the livestock sector and the grain side and just talked about the concerns they had.

The issue we really did hear from the livestock sector was how they were going to source feed and that's why we did what we did and we had to do it in a quick manner because it was so hot and dry in July that every day was taking its toll on crops.

From the grain side, obviously the concern we had, we've heard from them this fall is obviously contracts and the issue around not being able to fill contracts that farmers had signed.

Is that something that is probably going to be ongoing—is there going to be more consultations and engagement with the industry going forward?

I would like to. I think it's important for us as a ministry to hear from our stakeholders from all sides of it, not only from the primary producer but also from the industry as well.

I've reached out to the grain companies, had a good discussion with them and we'll continue to do that as well.

It's something we do and we're proud of it and I think the team here, the ministry of agriculture, really does a good job at looking after the industry and finding the right programs that work for the industry and that the industry is asking for.

I'll give you just a good example of what we did this year with the Farm and Ranch Water Infrastructure program.

That was capped at \$50,000 one time. So if you used it three years ago and you used the \$50,000, you were no longer eligible to use the Farm and Ranch Water program.

Continued on page B4

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Interview with Sask ag minister:

Marit says 2021 shows resilience of farmers

Continued from B3

So we upped that eligibility to \$150,000 and we paid a significant chunk of that \$150,000 at 70 per cent and the producer paid the 30 percent. And we saw quite a few farmers and ranchers take advantage of it with drilling wells and things like that.

That's just one thing, we listened at the ministry here to what the industry is looking for and tried to find a way to accommodate. We can't accommodate every request all the time, but we sure try to.

I wanted to ask you too, what do you see as the future of agriculture in Saskatchewan?

I'm very optimistic about agriculture. I think it's got a phenomenal future here in the province of Saskatchewan.

When you look at what's coming down the pipe with the announcements with the canola crush facilities being built in this province and the expansions there, these companies are looking at these with very wide open eyes as a smart business decision, and for them to make that decision to build here in the province of Saskatchewan bodes well for the agriculture industry here and it will have an impact on the farmers here—on their bottom line.

We're happy to see that, I think you're going to see more of that processing and things like that and I think

once the irrigation project gets up and running you'll see obviously expansions there and we are seeing expansions in irrigation.

My understanding is the number this year is well over 9,000 new acres of irrigation land here in the province of Saskatchewan. So obviously we're seeing that trend moving up and you're going to see value added crops grow and more vegetables. I was up there this fall, it's incredible the vegetables that are growing up in the Outlook area and we'll continue to see growth there too.

I am very, very optimistic about agriculture as a whole in the province of Saskatchewan.

I'm glad to see the Canadian Western Agribition Show is going on this fall. It brings buyers from around the world to come and look at the genetics here in not only Saskatchewan but Western Canada.

It's important that we are there to support it and promote it and that's really how I see my role as the ministry is to really work with the stakeholders and help promote agriculture here in the province of Saskatchewan.

What do you think are going to be the biggest changes you'll see in agriculture in the next five or 10 years?

You know, if there was one thing that I could say that through this whole time of Covid that we've been going

through, I think we did see an uptake in people really concerned about where their food comes from and how it's grown.

That's where I see some opportunity in processing, in value added, obviously with the canola crush facilities coming in, we also have red leaf straw board coming in to Saskatchewan as well.

And the one thing we are very proud of in the government is our commitment in investing and research.

We invest significantly in research here, in ag research, both on the livestock and the grain side, and I think you're going to see more opportunity that way with new crop varieties, higher proteins, you're going to see greater uses for the starches as well, whether it's commercial or food. We're just seeing those types of research that's really going to have an impact on the agriculture sector here in the province of Saskatchewan and it's going to continue to grow.

Obviously we're growing more and more grain. If we can hit our growth targets of 2030 that we want to see and hitting an excess of 40 million metric tonnes, you're going to see some dynamics here.

You're going to see some companies coming and looking at processing here and you'll see the export numbers growing as well.

Sask. Polytechnic

New ag program launched

Saskatchewan's agriculture-sector-identified need for multi-skilled workers has resulted in a unique new program.

Saskatchewan Polytechnic has announced a new three-year Agriculture and Food Production diploma program that will provide students with the foundational, technical, environmental and managerial skills to meet the needs of employers.

Potential employers could be farm operations, agriculture consultants, equipment dealers and commercial agriculture operations. The program will be delivered at Moose Jaw campus beginning in September 2022.

Designed with industry, for industry, the cross-discipline design of the proposed program provides students with a breadth of knowledge and skills, ranging from farm management, agriculture machinery, agricultural technology, crop production and livestock production.

The program will also discuss food security and how to deliver innovative solutions for the production of globally sustainable food.

"Our new Agriculture and Food Production program will produce cross-disciplined graduates, with the skills required to work in Saskatchewan's diverse agriculture sector," says Dr. Larry Rosia, president and CEO of Sask Polytechnic.

"Agriculture is an important industry in Saskatchewan and directly supports seven per cent of all employment in the province. Food security will continue to be a critical issue in the years ahead. Working closely with employers, Sask Polytechnic is building a curriculum to meet this sector's continuously evolving educational and training needs."

During the program, students will participate in three, paid co-operative education work terms.

This applied learning ensures graduates are ready to contribute on the job on day one.

An applied education gives learners the opportunity to apply the practical skills they learned at Sask Polytech in a work environment and bring work-place skills back to the classroom.

"At Sask Polytech, we're constantly reviewing and updating our programming to meet the needs of employers," says Jamie Hills, dean of the School

of Mining, Energy and Manufacturing as well as the school of Natural Resources and Built Environment. "This new program is a way to respond to Saskatchewan's evolving needs and ensure we are providing the skills-based training required to help support economic growth across the province. Whether you enjoy being on the land, working with animals, figuring out logistics or working in finance, there's a career for you in agriculture."

Graduates of the Agriculture and Food Production program could work in the high-demand field of crop and livestock production, management and handling or in precision and smart agriculture.

There will be opportunities for graduates in grain buying, marketing and transport, elevator or grain terminal operation, input sales, implement sales, and marketing or agricultural research.



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Survey finds on-farm cover crop innovation occurring across the Canadian Prairies



Continued from front

Right: Callum Morrison is a graduate student at the University of Manitoba specializing in cover cropping on The Canadian Prairies. Originally from Scotland, Callum is now living in the Red River Valley of Manitoba. Callum has thoroughly enjoyed the 2020 Prairie Cover Crop Survey journey, especially working alongside organizations, and most importantly, connecting with the farmers themselves.



Left: Dr Yvonne Lawley is a professor at the University of Manitoba. Her area of research is agronomy and cropping systems. Dr. Lawley's research has focused on several crops including soybeans, corn, and wheat and a range of management practices from residue management, strip tillage, to cover crops. Her research involves both small plot and on-farm field scale agronomy research. Dr. Lawley enjoys communicating the results of her research to a wide range of audiences including farmers, agronomists, scientist in a range of disciplines, and especially in the classrooms where she teaches at the University of Manitoba.

Who responded and where were they from?

In total, 281 early adopters took part that grew a cover crop in 2020. These farms grew 102,539 acres of cover crops. Farms were from every major agricultural region of the prairies. This highlights that cover crops are becoming established in the Prairies and it is possible to grow cover crops in a wide range of locations and environments across the three Prairie Provinces. 31% of respondents were from Alberta, 32% from Saskatchewan and 37% from Manitoba.

Benefits and challenges

The survey revealed that 81% of farms that responded have observed at least one benefit from growing cover crops, with the most common benefit, improved soil health, being experienced by 54% of farms. Most farms

(71%) identified that they had observed benefits within three years of growing cover crops.

Despite these benefits, the survey also identified common challenges that farms faced when adopting cover crops. The most commonly observed problems were related to the prairie climate, with 30% experiencing problems with the short growing season, and 27% having problems with cover crop establishment due to the lack of moisture in the fall.

Influence on farmer income

Despite these problems, only 4% of farms that responded reported that cover crops resulted in a drop in their farm net profit. A much higher 24% identified that cover crops resulted in no change to their net profit, and a further 24% identified that they saw an increase in farm net profit. A significant proportion of respondents (47%) were

not able to identify the influence that cover crops had on farm net profit. For this reason, it may be too early in the adoption process to determine how cover crops are influencing farm net profit across the Prairies.

What would enable cover crop use

Survey responses indicate that financial incentives may be the most effective method for enabling farms that responded to continue using cover crops or even to increase their acres. These incentives could include payments for storing carbon (59%) and tax credits for planting cover crops (55%). Similarly, 38% of farms that responded indicated that payments from conservation or watershed groups would enable increased cover crop use. Greater access to information, more scientific research, and technical assistance was also identified as a need to increasing cover crop adoption on the Prairies.

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New Manitoba legislation protects land owners from trespassers

New legislation in Manitoba amending the Petty Trespasses Act, the Occupiers' Liability Act and the Animal Diseases Act create new restrictions and offences related to trespassing on private property, Agriculture and Resource Development Minister Ralph Eichler and Justice Minister Cameron Friesen announced recently.

"Trespassing is an important issue in rural Manitoba, because every landowner has the right to have their property respected," said Eichler.

"Farms and rural property need to be protected as a business, but also as people's homes. Trespassing can expose farms and food production facilities to biosecurity risks that could spread disease and may cause injury and stress to farm animals."

Bill 62, the Animal Diseases Amendment Act, strengthens legislation to protect biosecurity zones in place on agricultural operations, and help to protect livestock from biosecurity breaches during transport and at food-processing facilities. Bill 63, the Petty Trespasses Amendment and Occupiers' Liability Amendment Act, removes the need to confront trespassers where possible, by making entry onto certain



specified premises without permission an offence, unless the person has a lawful excuse for doing so.

Manitoba livestock farmers are concerned about on farm safety for their families and their livelihood. Anyone who enters

a biosecurity zone without permission can compromise the biosecurity of the livestock and therefore the safety of food produced at the premises, Eichler noted.

"KAP welcomes the announcement that the bills

62 and 63 have received proclamation and are in effect. Improvements to trespassing and biosecurity laws are important steps in ensuring Manitoba farm families feel safe and biosecurity protocols are maintained," said Bill Camp-

bell, president, Keystone Agricultural Producers.

These amendments establish proactive measures that recognize the importance of biosecurity practices, guided by national standards, and ensure that biosecurity zones are protected. These changes are based on recommendations by Manitoba's auditor general to strengthen legislation to support the province's ability to proactively address an animal disease emergency, Eichler said.

"The Manitoba government is committed to protecting the property rights of Manitobans," said Friesen. "We have listened to Manitobans and their concerns about rural crime, and we are proud to be providing landowners with greater protection from civil liability for the actions of trespassers."

The bills are in response to concerns raised about rural public safety and crime, and puts Manitoba in with other jurisdictions, added Friesen. After a significant public consultation process that included thousands of Manitobans and stakeholders, the bills were passed in the legislature on May 20.

Amendments to the Occupiers' Liability Act ensure a landowner's legal

responsibility for injury is fair and reasonable when someone is on their property without permission. Previously, owners, occupiers or tenants of premises had the same level of legal responsibility for injury or harm to criminal and non-criminal trespassers.

Amendments to the Preset Fines and Offences Descriptions Regulation under the Provincial Offences Act will permit enforcement officers to issue tickets with set fines for offences with respect to animals in transport and at food processing facilities.

The Animal Diseases Act has taken effect on Oct. 8, and the Petty Trespasses Act and the Occupiers' Liability Act took effect on Oct. 15.

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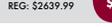
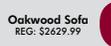
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USask announces new Insect Research Facility

The new University of Saskatchewan (USask) Insect Research Facility (USIRF) will be the first of its kind in a western Canadian university and one of only a handful of facilities in the country specifically designed to conduct research on arthropod plant pests and beneficial insects.

Funding for the design and construction of the USIRF will be provided from a variety of sources. Contributions include \$500,000 from Western Grains Research Foundation (WGRF) as part of its \$32 million Capacity Initiative. Additional funding includes \$285,000 from the Canada Foundation for Innovation, \$70,000 from the Saskatchewan Canola Development Commission, \$70,000 from Saskatchewan Pulse Growers, \$70,000 from the Saskatchewan Wheat Development Commission, and \$50,000 from USask.

The USIRF will be led by Dr. Sean Prager (PhD), the first entomologist at USask's College of Agriculture and Bioresources. He was specifically recruited in response to increased need for entomological research, training and instruction in Saskatchewan and at USask.

"This new facility will add substantial research capacity to the University of



High magnification image of a pea aphid (*Acyrtosiphon pisum*). Pea aphids are one of many species of insects that will be studied in the new University of Saskatchewan Insect Research Facility.

Saskatchewan," said Prager. "It will allow us to work with the USask Crop Development Centre, Agriculture and Agri-Food Canada and USask plant breeders to identify problematic resistance traits to pests that are yet to be established. This provides a massive head start when you consider the time it takes to breed new varieties and cultivars. We will also be providing training opportunities to develop advanced economic entomological skills that have become increasingly important."

"Insects can be harmful as crop pests or beneficial as crop pollinators or as natural enemies to insect pests," said WGRF Board Chair Dr.

Keith Degenhardt (PhD). "Research at USIRF will be positive for producers and will find new methods for predicting pest outbreaks and decreased pesticide use."

"This new research facility will result in new and sustainable pest management strategies for important Western Canada field crops including canola, wheat, barley, oats and pulses," added Garth Patterson, WGRF executive director.

The USIRF will be located inside the Agriculture Building on the USask Saskatoon campus. Architectural planning has already begun and once complete, the USIRF will hold dozens of different species of insects at a time.

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Tips to keep clubroot 'low and local'

BY AUTUMN BARNES

A new factsheet available at clubroot.ca distills the key practices to mitigate clubroot and maintain profitability.

Practices include growing clubroot-resistant (CR) cultivars responsibly on all canola acres. In 2020, only 39 per cent of the canola cultivars grown in the Canadian Prairies were CR, according to Canadian Grain Commission data. While CR will be a standard feature on most canola hybrids by 2025, canola growers should start to use CR and other integrated management strategies immediately.

Clubroot is the disease caused by soil-

borne spores of the protist and obligate parasite, *Plasmodiophora brassicae*. Spores spread easily and early infections can be missed for years while clubroot-susceptible canola multiplies spores to catastrophic levels. Planting CR cultivars before the disease gets established will help slow spore reproduction.

Keeping spore concentration low helps maintain yield and protect CR traits. Growers who wait until the disease has taken hold in a field before choosing CR can be stuck with challenging levels of clubroot for a long time.

Higher concentrations of *P. brassicae* spores lead to larger clubroot galls, more risk to yield, more resting spores released back to the soil and fewer management options. (The goal is to keep spore concentrations "low").

Preventing the introduction and spread of *P. brassicae* spores will prevent the clubroot disease from establishing and spreading. (The goal is to keep spores "local").

Responsible use of CR cultivars includes an integrated approach to clubroot management, which will help to protect the CR trait. Integrate the following practices to keep spores low and local.

Keep spores low

- **Rotate crops.** Maintain a minimum two year break between canola (1-in-3 rotation).
- **Scout.** Examine roots

in every canola field during late summer/fall. Pay special attention to high-traffic and high-moisture areas. Soil testing may help identify spores before physical symptoms appear.

Keep spores local

- **Take biosecurity measures.** Commit to a biosecurity plan to prevent the introduction and spread of spores on contaminated inputs and equipment. Communicate sanitation expectations with all relevant parties before field entry.
 - **Reduce tillage.** Minimize soil (and spore) movement within and between fields.
- Visit clubroot.ca to learn more about the clubroot disease cycle and management, and to see the full factsheet.

Autumn Barnes is an agronomy specialist and clubroot lead with the Canola Council of Canada. Email barnesa@canolacouncil.org.

Love Canola? Hate Clubroot.

What is clubroot?
Clubroot disease is caused by soil-borne spores of the protist *Plasmodiophora brassicae*. These spores infect canola roots, restricting water and nutrient uptake and limiting their growth and yield.

How am I affected?
Canola can be infected from infected soil, but spores spread easily and early infections can be missed for years while clubroot-susceptible canola multiplies spores to catastrophic levels. Planting CR cultivars before the disease gets established will help slow spore reproduction.

What can I do?
Keep spores "low and local" by growing clubroot resistance (CR) as part of a proactive, integrated prevention and management plan for all canola acres.

Keep spores low

- **Rotate crops.** Maintain a minimum two year break between canola (1-in-3 rotation).
- **Scout.** Examine roots in every canola field during late summer/fall. Pay special attention to high-traffic and high-moisture areas. Soil testing may help identify spores before physical symptoms appear.
- **Control brassica weeds in all crops.** Weeds like volunteer canola, stinkweed, fleabane, shepherd's purse and mustard are common hosts for clubroot spores. Control weeds in all crops, not just canola, to reduce spore levels.
- **Reduce tillage.** Minimize soil (and spore) movement within and between fields.
- **Take biosecurity measures.** Commit to a biosecurity plan to prevent the introduction and spread of spores on contaminated inputs and equipment. Communicate sanitation expectations with all relevant parties before field entry.
- **Reduce tillage.** Minimize soil (and spore) movement within and between fields.
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Keep spores local

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canola council | Visit clubroot.ca to learn more.



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USask research: Multi-species bacteria a threat to Canadian swine industry

A previously innocuous bacterium that's considered to be part of a pig's biological makeup is causing increased cases of fever and death among Canadian swine herds.

By JESSICA COLBY

Several years ago, no one in Canada's swine industry would have been concerned about the potential risk of *Streptococcus equi* subsp. *zooepidemicus*—a bacterium that can cause infection in virtually every species, explained Dr. Matheus Costa (DVM, PhD), a swine medicine specialist at the University of Saskatchewan (USask).

"Before 2019, if anyone investigating clinical cases found this bacteria in a pig, they would suggest this is a commensal [bacterial], it is just part of the normal biota of a pig," said Costa, an assistant professor at the Western College of Veterinary Medicine (WCVN) at USask. "We find it in healthy pigs all the time, so we never worried about it."

However, that perception shifted in 2019 when *S. zooepidemicus* bacteria began posing a serious health threat to swine herds across Canada and around the world. During that same year, researchers were alerted to *S. zooepidemicus* outbreaks among pigs in New Zealand and the Netherlands.

"The problem [with *S. zooepidemicus*] is that it looks like it flares up over and over again," said Costa. "It just doesn't go away. Antibiotics will suppress it, we take [antibiotics] out, it comes back again."

As with other illnesses, some pigs (known as carriers) can also carry *S. zooepidemicus* without displaying clinical signs—a find-

ing that was recently reported by Costa and his research team.

The WCVN research group is now aiming to discover how Canada's swine producers can prevent this disease from establishing itself in their barns. Costa is also investigating the development of non-antibiotic therapies and prevention strategies to reduce the disease's severity.

"Because it's bacteria, antibiotics are usually the first thing we do. We can suppress disease by treating pigs aggressively," said Costa.

However, veterinarians need to ensure that they are using the right antibiotic drugs to combat the infection so they don't induce antimicrobial resistance. Costa said the main challenge is that researchers and veterinarians don't understand enough about the disease "so we don't know how [to] control it beyond antibiotics."

He and his team are trying to determine what will slow the spread of *S. zooepidemicus* in barns, whether that includes workers washing their boots, testing every animal, or depopulating a barn—a drastic option that's costly in terms of time and money.

"Depopulation means all the pigs go through the barn flow and then we empty the barn physically. Pigs are removed and the entire barn, top to bottom, is disinfected. Then we start repopulating," said Costa. "We've done that before, and it doesn't



University of Saskatchewan scientists are working to discover how to prevent *Streptococcus equi* subsp. *zooepidemicus* from establishing itself in swine barns.

get rid of the bug—likely because of carrier pigs."

Another problem with *S. zooepidemicus* is that its clinical signs are similar to a dangerous and extremely infectious virus called African swine fever (ASF) that causes high mortality rates in domestic pigs. Due to the similarities in presentation, it's impossible to distinguish between *S. zooepidemicus* and ASF without extensive testing.

"*S. zooepidemicus* looking like African swine fever adds another layer of complexity to this because we're not just dealing with a new disease. We need to make sure we don't have Afri-

can swine fever as well, so we're both trying to rule out African swine fever from clinical cases and making sure we understand this new disease," said Costa.

ASF recently wiped out one-third of China's swine herd. While ASF has been detected among swine herds in the Dominican Republic and Haiti, no cases have been reported in Canada and the United States so far.

S. zooepidemicus usually affects older pigs, and its initial clinical signs include a lack of appetite and lethargy.

"There is an invasion of the whole body—it goes every-

where. Once it has access to the blood, it can essentially attack any organ and that's what we see: septicemia," said Costa. "We see lesions in multiple organs, and that's where it becomes challenging to differentiate it from African swine fever, because that's what the African swine fever virus does."

Unless the pigs have what Costa calls "nose-to-nose contact," there is little chance the disease will be transmitted between the animals. A recent WCVN trial concluded that the bacterium spreads through physical contact.

"We've learned that if we have sentinel pigs in the room together with pigs that have *S. zooepidemicus*, the sentinel pigs never become infected if they don't have nose-to-nose contact," said Costa. "They could be close—at one metre and a half apart—but they don't get it."

"We're going to facilitate dealing with the disease as we progress and as we learn more about it."

Saskatchewan's Agriculture Development Fund, Alberta's Results Driven Agriculture Research and Canada's Natural Sciences and Engineering Research Council provided funding for this study.

Jessica Colby of Montmartre, Sask., is a University of Regina journalism student. She worked at the WCVN as a summer research communications intern in 2021.



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 Hill Acreage Spy Hill SK, RM No. 152 \$239,000 MLS# SK861112	 Cana Land Only Cana, RM No. 214 \$250,000 MLS# SK872146	 1301 Park Ave Esterhazy, SK \$265,000 MLS# SK870776	 106 Crescent Lake Rd. Saltcoats, SK \$235,000 MLS# SK867498	 509 Babyak St Esterhazy, SK \$139,000 MLS# SK838846
 Lowenberg Qrt Kingsley TM No. 124 \$300,000 MLS# SK867719	 Penner Quarter Saltcoats RM No 213 \$309,000 MLS# SK873985	 34/36 Calwood Cres Yorkton, SK \$465,000 MLS# SK866081	 604 Kaposvar Drive Esterhazy, SK \$399,000 MLS# SK868142	 1030 Assiniboia Ave Grayson, SK \$219,000 MLS# SK872450
 Borsa Farm Moose Range RM No 486 \$3,250,000 MLS# SK851443	 279 Hamilton RD Yorkton, SK \$1,100,000 MLS# SK863520	 1021 4th Ave Esterhazy, SK \$1,600,000 MLS# SK865078	 220 2nd Ave. Esterhazy, SK \$198,900 MLS# SK868483	 532 Sumner St Esterhazy, SK \$269,000 MLS# SK872305