

DECEMBER 2023



Photo by USask Livestock and Forage Centre of Excellence

Cows feeding at the Livestock and Forage Centre of Excellence at USask.

USask cattle feed innovations good for the planet and our pockets

By exploring novel treatments to existing agricultural byproducts, University of Saskatchewan (USask) researchers are working to establish environmentally sustainable and economically feasible feed alternatives to benefit Saskatchewan producers and consumers alike

BY LINDSAY HERMAN, RESEARCH PROFILE AND IMPACT

With winter upon them, Canadian beef and cattle producers are facing a familiar challenge: keeping their herds fed outside of grazing season. The reality of cold-climate cattle production relies heavily on the storage and use of feed crops, such as hay and other cereal grains. As Dr. Gabriel Ribeiro (PhD), assistant professor in the Department of Animal and Poultry Science at the College of Agriculture and Biosciences notes, climate change has caused drier growing seasons that make these traditional feed sources less available and more costly.

"In the last few years, the price of feed has skyrocketed. The price of grain was the highest we've ever seen. This really puts producers in a situation where many of them are questioning whether they will stay in business," said Ribeiro.

These increased production costs have also impacted the price of meat and dairy products in Saskatchewan supermarkets.

In response, Ribeiro is leading a study with USask's Drs. Gregory Penner (PhD) and Bart Lardner (PhD) to explore how the application of alkali treatments to agricultural byproducts such as straw, in addition to oilseed screenings supplementation, can provide more affordable and sustainable alternatives to traditional feeds.

With funding from the Government of Saskatchewan's

2023 Agriculture Development Fund, this multi-year project will engage a large team of USask researchers and industry partners to innovate towards more reliable, affordable, and environmentally friendly cattle feed options.

From straw to gold

Straw is an abundantly available agricultural byproduct that has been traditionally considered low-quality, and because of that is underutilized. The fibre in straw—a residue of cereal crop production—is hard to digest, and lacks the protein needed to sustain healthy cattle. Ribeiro and his team are working to increase the digestibility of straw by treating it with alkali—such as calcium oxide and calcium hydroxide—and supplementing it with screenings of oilseeds like canola and flax, to help the microbes in the digestive tracts of cattle break down this tough fibre.

Ribeiro's team will also explore how the addition of oilseed screenings can provide essential protein and amino acids to cattle gut microbes, further supporting the breakdown of fibre and increasing the overall nutrient profile of the diet.

"What we're trying to do here is make sure that we improve the chances that cattle will have to make the most [of these feeds]," Ribeiro said.

For Western Canadian beef and dairy producers, improving the quality of these agricultural byproducts and crop residues as cattle feed would boast a significant impact, particularly when the costs of more common feed options are high.

"Finding ways to promote economic sustainability is essential," said Ribeiro. "If producers can't keep producing because it's too expensive, then consumers will feel that."

As two sides of the same coin, the economic viability of Canadian beef and dairy will also help ensure a consistent and affordable supply to Canadian consumers.

Environmental sustainability—a key priority of the innovative agricultural research taking place across USask—is also central to the potential impact of this research. By giving new life to existing agricultural byproducts, these alkali treatments can have a significant impact on the land, energy and water used to grow traditional feed crops.

"By using these crop residues and using some of those oilseed screenings, we have a huge potential to reduce the carbon footprint of beef and dairy cattle production in Western Canada," Ribeiro said. "We feel that this project is a win-win for both the producers and society in general."

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Have a wonderful and joyous Christmas season!

My first thought the morning of the big snow back a couple of weeks ago was, "Oh no, the flights out of Regina will be cancelled." Not that I was flying anywhere, but our son and his family were all set to leave from Regina that morning and had traveled up to the city the night before. I envisioned a disappointed family stuck in a hotel room watching the weather and the flight schedules and wondering when they would be able to get on their way. In response to my text, "Are all flights cancelled?" this is what I got. "Nope, why?" And so it was that Regina, a mere hour and a half west of us, had zero rain and snow while we were inundated with it.

While I was happy for them, I was a little less enthused about heading outside myself but as seasoned outdoorspeople we bundled up and out we went, ready to tackle what had to be done, thankful I had just purchased battery-heated mitts.

And so it was, as the kids and the grands flew off to more tropical climes for a bit of a getaway, hubby and I tackled the snow—heavy, wet snow. Once the driveway and the sidewalks were cleared in town, it was off to the farm, battling nasty highways, clearing the lane way and bedding the cows with an extra layer of straw. How interesting that hubby's cattle duty days would start with a snowstorm. Not even the dogs wanted to come out of their dog house that morning.

As for the rabbit, I wasn't sure if he was dead or alive when I went to check on him. As it was, after throwing in some lettuce for him, he emerged from his coffin to greet the day. And it is a coffin, albeit a stage prop from the former drama club, gifted to me because I was the only one who raised my hand when they asked who would like a coffin. I guess not many people have need of a fake coffin. But filled with straw, it is perfect for Oliver, the bunny. After all, not even a snow storm causes him any concern at all.

The best part of a good snowfall on the prairies is that it is moisture for the fields and, at this time of year, it makes for a very pretty backdrop to the outdoor Christmas décor. Tinkle tours, here we come!

And what a delightful season it is! While I am not the most creative decorator in the world, I was excited to get my trees up and decorated and get ready to enjoy all the Christmas fun that was and is happening—our annual light-up Whitewood contest—Santa Night at the rink—Christmas school concerts—late night shopping—Christmas church services and Christmas carol festivals—Christmas bake sales and Christmas suppers and fun times with friends.

Of course, as usual, I am procrastinating doing a number of things, namely baking (last year was a fiasco because I simply don't belong in the kitchen) and doing the year-end farm books. I don't think I will ever get to a point in time where I will actually look forward to doing farm books. I mean, does anyone actually look forward to that? You

The Lighter Side of
Life...
DOWN ON THE FARM

by donna beutler
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would think after 46 years, I would get past the feeling of dread at the thought of sitting down at the computer and entering all those bills, but no, I just procrastinate. The positive outcome though is the house really gets a good cleaning because when I procrastinate doing financials, I clean like crazy.

In order to conquer these 'dreaded' tasks, I have printed out or copied a few recipes and put them into what is being called my Christmas baking notebook. No new recipes, and not very many of them at that, but enough that it will perhaps become my go-to book this Christmas and future ones too! Depending of course if I can find the notebook next Christmas season. As for the farm books, I grabbed 20 invoices out of the 500 that need entering, clipped them together and put them on the table at 'my spot' with the self-imposed rule that those 20 entries have to be made before my next meal. Does this sound like a well-organized, goal-oriented person to you? Perhaps I should add a bowlful of Lindors to my spot at the table with a note that says, "Once you have made 'x' number of entries, you can have a chocolate." How is it that I don't procrastinate when I have posters or menus to design or an article to write or a table that needs refinishing? Ahhhh...I guess we all have our passions! Dealing with numbers isn't mine.

I am reminded though, that amidst the busy-ness of the season, there are times to sit back and enjoy some extended family and friend time and to spread some warmth and kindness to those around us, especially those who may find themselves in need.

This year, hubby and I, along with our neighbours, are carrying on the tradition of making a turkey dinner for some seniors in our neighbourhood, something we have enjoyed doing for several years now. I remember when I was just a little kid hearing adults talk about the joy of giving and I will admit that I didn't really understand the 'joy' in giving because my little world revolved more around the 'getting' at Christmas time. I have to say the best part

of getting together with our senior friends across the way is simply enjoying their company, sharing Christmas turkey together, singing a Christmas carol or two and playing some games.

This year, my daughter and I decided to become magic elves and so it was that last week we went to Regina to my 'other' daughter's place to secretly invade her house and do her pre-Christmas cleaning while she was at work. And oh what fun we had just anticipating what her reaction would be when she got home. We swept and vacuumed, mopped and dusted and enjoyed the company of Karl, the kitty. Karl was, I think, supportive of our day spent with him as he chased the broom and insisted on us running the water in the bathroom so he could lay in the sink and swat the water. I told my daughter's hubby to take the credit for the deep clean but I guess she wasn't fooled and knew exactly who had been there. And our hearts were warmed in just having done something that was so meaningful to someone we love.

As I close off this Christmas column, my hope for all our readers is that you have an opportunity to enjoy some special moments together with friends and family and that you will be able to reach out to others with a helping hand, a warm smile, a heartfelt hug. Be an elf this Christmas and surprise someone with the gift of something totally unexpected, one that maybe doesn't even involve money or wrapping paper.

And so, from my little spot on the farm in southeastern Saskatchewan (the very best place to call home) and from all of us at the newspaper: "Have a very wonderful and joyous Christmas season and we'll see you all in 2024!"

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New will and estate pre-planning tool available for Canadian producers

JILL McALISTER

CORPORATE COMMUNICATION, FCC

Farm Credit Canada (FCC) is announcing the release of a new Will and Estate Pre-Planning Tool for Canadian farms. It will provide producers with the starting point they need to think about how to successfully plan for the future of their operations.

The Farm Transition - Will and Estate Pre-Planning Tool for Canadian farms is based on Dr. Tom Deans' Willing Wisdom Index platform. It has been adapted to reflect the unique needs of Canadian farm owners. Producers will get their own personalized recommendations and checklist minutes after answering a series of questions. The checklist will identify what is being done well and any existing gaps in estate planning.

"The tool is meant to give urgency to a conversation that families often find difficult to start," said Dr. Tom Deans, intergenerational wealth transfer expert, speaker and author. "There's no other industry where a business owner forges such a close emotional connection to the business. You live on the very thing you are working. It's more than a business, it's an identity and to transition it to someone else is excruciating and a deeply emotional subject."

The will and estate tool can be used to start a conversation between family members on how to bring in and use resources like lawyers, accountants and wealth advisors in their plans.

"Many people in the agriculture industry tell us that will and estate planning is an overwhelming task and so it's common for producers to avoid it. This tool complements the FCC's Advisory Services who are already helping Canadian farmers begin these conversations," said Greg Thamarat, FCC manager, advisory services. "By using the tool, producers will gain greater insight into this important step in their transition journey, as well as come away with a list of questions to bring to their advi-



sors in advance of those plans."

"Once families get rolling on it, they are remarkably resilient at moving through the planning process," said Deans. "Often the second generation is waiting for their parents to say 'hey we need to talk about where the farm is going', but the kids don't know how to start the conversation and the parents are afraid of the conversation and then if someone dies, it's a mess." Deans encourages people to point to the report as a reason to start talking about will and estate planning and avoid the erosion of family relationships and wealth.

"A farmer will take 8 to 10 minutes, go through the checklist, hit enter, get the report and see what they have to do. The recommendations will be clear and a common one will be to sit down and talk to the family," said Deans. "You can blame the index and say 'hey I did this, and it says we should sit down. What do you guys think?' Blame the report but now you have something in your hand that

you can point to which is very different than saying 'we need to talk'."

The will and estate pre-planning tool is free, completely anonymous and confidential. The personalized checklist and recommendations producers receive include actions that can be taken immediately. They can then go back to the tool multiple times to see their score improve and checklist change based on what they have accomplished. It can be found at WillingWisdom.com/FCC.

FCC is Canada's leading agriculture and food lender, dedicated to the industry that feeds the world. FCC employees are committed to the long-standing success of those who produce and process Canadian food by providing flexible financing, AgExpert business management software, information and knowledge. FCC provides a complement of expertise and services designed to support the complex and evolving needs of food businesses. As a financial Crown corporation, FCC is a stable partner that reinvests profits back into the industry and communities it serves. For more information, visit fcc.ca.

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GIFS at USask partnership receives \$56 million commitment for Bangladesh agtech centre

BY DANIEL HALLEN, USASK

A research and training initiative launched by the Global Institute for Food Security (GIFS) at the University of Saskatchewan (USask) and the Bangladesh Agricultural Research Council (BARC) of the Ministry of Agriculture in Bangladesh has received a \$56.2 million commitment from the Government of the People's Republic of Bangladesh.

The funding, to be invested over five years, will support the establishment of the Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre (BP-ATC) as a centre of excellence at the Bangladesh Rice Research Institute in Gazipur, Bangladesh.

The commitment to the BP-ATC will support the development of research infrastructure and help GIFS, BARC, and other partners to purchase equipment, train more than 30 graduate students and post-doctoral fellows, and lead research enhancing wheat, rice, lentils, canola, and other crops.

Approximately \$9.8 million will support research and training occurring within Saskatchewan through activities at GIFS and other partners, including the Global Institute for Water Security, USask College of Agriculture and Bioresources, the Saskatchewan Food Industry Development Centre, the Prairie Agricultural Machinery Institute, and the National Research Council of Canada.

GIFS' partnership with BARC was established in 2020 to promote sustainable food security. Bangladesh has experienced food security and production challenges resulting from rapid population growth, loss of agricultural land to urbanization, post-harvest losses and climate-induced stresses, including drought, heat, and soil salinity.

Research and innovation have driven Canada's and Saskatchewan's agriculture success and GIFS' partnership with BARC is designed to use these assets to deliver joint programs that enhance farmer incomes, address the effects of climate change, and provide valuable research information for Saskatchewan and Canadian agriculture.

Through the BP-ATC, partners in Saskatchewan and Canada will contribute to programs pursuing the following research objectives within Bangladesh:

- Enhance crop breeding and plant improvement using genomics and phenomics;
- Advance soil health and quality;
- Improve soil water regime and adaptation;
- Deliver innovations for post-harvest food handling and processing; and
- Increase data management and analytics in agricultural research.

Since the establishment of the GIFS-BARC partnership, GIFS has opened its regional office in Dhaka, Bangladesh, and established two research chairs in food



Earlier this year, Bangladesh Prime Minister Sheikh Hasina participated in an event at the Bangladesh Rice Research Institute where officials, including GIFS CEO Steven Webb, celebrated the inauguration of the Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre.

security—one at USask, held by Dr. Andrew Sharpe of GIFS, and a second in Bangladesh—who are already working with graduate students and post-doctoral fellows researching plant genomics and postharvest traits.

The BP-ATC's name recognizes the longstanding ties between Canada and Bangladesh. Bangabandhu Sheikh Mujibur Rahman was the first Prime Minister of Bangladesh, and Canada—led by Prime Minister Pierre Elliott Trudeau at the time—was one of the first countries to recognize Bangladesh's independence in 1971.

The GIFS-BARC partnership also builds on the history of collaboration and trade between Saskatchewan and Bangladesh, which is one of the province's Top 10 trading partners.

"The Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre is an exciting, collaborative initiative that will deliver tangible results for all stakeholders," says Dr. Steven Webb, Chief Executive Officer, Global Institute for Food Security. "With the expertise of Saskatchewan's agri-food sector, we are building capacity and infrastructure to support advanced research in Bangladesh that can inform sustainable, climate-resilient agriculture in that country, as well as Canada. As part of this partnership, crop research into wheat, canola, and lentils will generate important data about growing crops in high-stress environments that will

benefit Canada and other regions across the world. We are grateful for the continued support of the Government of the People's Republic of Bangladesh, Prime Minister Sheikh Hasina and our partners in Canada and Bangladesh who share our vision of a world where everyone has access to safe and nutritious food."

"The establishment of the Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre is a significant accomplishment and a key component of our ambitious partnership with the Global Institute for Food Security that will have a long-lasting, positive impact on research and development in Bangladesh," says Dr. Shaikh Mohammad Bokhtiar, Executive Chairman, Bangladesh Agricultural Research Council. "The infrastructure we are building, scientists we are training and research we are conducting will support enhanced and sustain-

able agriculture for future generations in Bangladesh."

"The Government of the People's Republic of Bangladesh has embarked on a strategic initiative to enhance the production of safe and nutritious food within Bangladesh—an effort that's supported through important initiatives like Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre," says Wahida Akter, Secretary, Ministry of Agriculture, Government of the People's Republic of Bangladesh. "Saskatchewan is a leader in innovative agricultural research and development, and the knowledge and technology transfer facilitated by the Global Institute for Food Security and other partners are contributing to these goals and promoting a resilient and sustainable food system within Bangladesh."

"The continued development of the Bangabandhu-Pierre El-

liott Trudeau Agriculture Technology Centre strengthens the important and growing relationship between Bangladesh and Saskatchewan," says Dr. Muhammad Abdur Razzaque, Minister of Agriculture, Government of the People's Republic of Bangladesh. "We look forward to the insights and innovations this research and training initiative will deliver and the advancement of agricultural production and trade in both countries."

"USask researchers are committed to discovering the most sustainable and innovative methods to address the world's complex food security issues," says Dr. Peter Stoicheff, President, USask. "The Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre combines state-of-the-art technologies and some of the brightest minds in the field to tackle these urgent challenges. This valuable work will help people around the world and right here in Saskatchewan."

"The growth and expansion of the Bangabandhu-Pierre Elliott Trudeau Agriculture Technology Centre is a testament to USask's ongoing commitment to collaboration, international partnerships and being the university the world needs," says Dr. Baljit Singh, Vice-President Research, USask. "USask's agriculture researchers at GIFS and our College of Agriculture and Bioresources have been at the forefront of novel methods that have shaped the way people approach agriculture and food security across the world. By working in partnership with agriculture scientists in Bangladesh, we can aptly harness our knowledge and resource the next generation of researchers who will continue to combat the global food security crisis. This collaboration will make a difference not only for the people of Bangladesh but also for Canada and the world."

For more information on the GIFS-BARC partnership and the BP-ATC, see gifs.ca/Bangladesh.



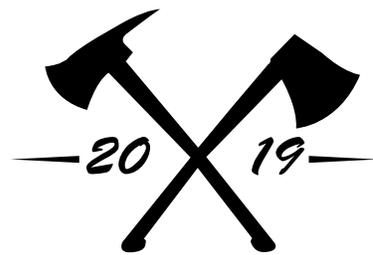
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-Doug & Dianna Calverley



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Dr. Kate Congreves (PhD) is an associate professor in the College of Agriculture and Bioresources at USask.



Dr. Richard Farrell (PhD) is an associate professor in the College of Agriculture and Bioresources and the Ministry of Agriculture Strategic Research Program Chair in Soil Biological Processes at USask.

Seeking a holistic understanding of soil health at USask

BY JOANNE PAULSON

Climate change is not just about carbon. As a climate change driver, to be sure, carbon dioxide (CO₂) remains a large issue and a constant part of the conversation around reducing greenhouse gas (GHG) emissions.

But particularly for an enormous country like Canada with vast tracts of land that grow food, a wider understanding of how soil health factors into the emissions equation—along with crop production and the economy—is crucial.

Gas emissions other than CO₂, such as fertilizer-related nitrous oxide (N₂O), have more recently hit the public radar. As recently as 2021, articles in both mainstream and scientific media called N₂O “the world’s forgotten greenhouse gas.”

It may not have been the driver of public discourse, but it was not forgotten by the team of soil experts at the University of Saskatchewan (USask).

The team, which includes members of the College of Agriculture and Bioresources (AgBio) as well as the College of Engineering, and the Department of Computer Science in the College of Arts and Science, is bringing together and combining elements from emissions to microorganisms to computer modelling.

Traditionally, the focus of soil research was mainly on fertility, according to Dr. Richard Farrell (PhD), associate professor in the College of AgBio and Ministry of Agriculture Strategic Research Program Chair in Soil Biological Processes.

GHGs then began to come into research exploration with a strong focus on carbon dioxide emissions and sequestration.

Today, USask researchers are evaluating a much bigger picture including various environmental, economic, socioeconomic, and agronomic factors, he said.

Farrell’s own research is focused on greenhouse gas measurements and mitigation. He notes that air quality, water quality and soil quality are all tightly related.

“If soils are poorly managed, you can have runoff; you can have nitrates and phosphates moving into the water. Pollutants can move into the ground water if they’re not properly managed,” he gave as

an example.

And when it comes to growing crops, carbon has more of an upside than nitrous oxide.

“Plant growth and crop development are taking carbon out of the atmosphere and pumping it into the soil, so we are sequestering it that way,” Farrell said.

Farrell notes that soils used predominantly in agriculture are the major source of nitrous oxide emissions because of the fertilizer used to grow crops.

“Nitrous oxide is a greenhouse gas roughly 265 times more potent in terms of global warming than CO₂,” he said.

While farming sequesters tonnes of carbon into the soil, just three and a half kilograms of nitrous oxide offsets one tonne of CO₂.

“That’s one of the things we’re looking at: what is this balance between carbon being put into the system and nitrous oxide coming off the system?” said Farrell.

Saskatchewan soils tend to be carbon sinks, and that tendency has been improved by farmers using no-till or minimum-till practices, “so more carbon is going in than is released,” he said. “But nitrous oxide is continuously released from the soil.

“Emissions may not get down to zero, but we want to get them down to background levels, where they would be if we weren’t cropping things.”

Farrell is investigating how to minimize nitrous oxide emissions with Dr. Reynald Lemke (PhD) at Agriculture and Agri-Food Canada, and Dr. Kate Congreves (PhD), an associate professor in the College of AgBio.

Minimum tillage will help, “but we also need to start looking at fertilizer and crop management,” Farrell said.

One form of mitigation already underway is farmers increasingly adding nitrogen-fixing pulse crops such as chickpeas, faba beans and field peas to their rotations.

“(Nitrogen-fixing pulse crops) basically generate 50 to 80 per cent of their entire nitrogen need from atmospheric nitrogen,” Farrell said. “You don’t have to put in nitrogen, or not as much, and consequently in the years you’re growing pulses, nitrous oxide emissions are quite low.”

Continued on page C8

Photos by Christina Weese

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Seeking a holistic understanding of soil health at USask

Continued from page C5

"They also leave nitrogen in the soil, so the crop following needs less nitrogen fertilizer as well."

Other management tools coming into use are enhanced-efficiency fertilizers. Coated in polymers or sulphur, they slowly release urea fertilizer into the soil. There are also "stabilized" products that include a urease or nitrification inhibitor, or both.

"In dryland systems like in Saskatchewan, we are seeing anywhere from 20 to 40 per cent emissions reductions just by switching to an enhanced efficiency product and in the irrigated systems, we've seen even larger emissions reductions, say 40 to 60 per cent or more," Farrell said.

He has also investigated the effect of shelterbelts on emissions. Trees store a great deal of carbon, and shelterbelts influence an area one and a half times the size of the trees, while having lower emissions than the field.

"(Trees are) storing more carbon and are good places to put carbon," he said.

"We have to look at these integrated landscapes. A farm will have ponds and shelterbelts and other elements and all of that affects the soil health."

Congreves, meanwhile, in addition to her work with Farrell, is researching soil health from various perspectives, including measurement.

"We collect samples from all over the province, and the Prairies, and different cropping systems," she said.

"We're looking at soil health in a holistic way, including ecosystem and socio-ecological functions. Soil health is not the same as soil fertility. Soil fertility is primarily based in nutrient availability and linked to fertilizer management, whereas soil health encompasses the ecology of the crop production system and surrounding land."

Her research, focused primarily on cropping systems, looks at conventional and regenerative practices over the whole spectrum—not just large-scale agriculture, but smaller-scale gardens producing fruits and vegetables

too.

"We measure carbon-based indicators of soil health, nitrogen-based indicators, and also look at soil life including biological indicators such as microbial biomass, their activity, and stress responses," she said.

"The goal here is to help growers be stewards of the soil. Soil health assessments help people not just take but give back to the soil. Our research provides soil health metrics that help inform people's decision-making matrices."

In practical terms, at the farm or in the garden, producers are interested in collecting soil samples, having them analyzed in the lab, and getting a soil health score card in return. Congreves' research helps develop and advance these soil health scoring tools.

"These scoring tools take really complex information and soil science data and turn them into an easy-to-understand tool for growers to interpret how their soil might be changing over time and how they can manage it."

Both Farrell and Congreves say the collaborative team on campus is advancing soil health and its measurement while creating an inspiring atmosphere.

Farrell has been with the university for 27 years and has watched the field evolve. For example, three decades ago, there was little interaction with computer science. That connection has evolved and is making a huge difference today in the era of machine learning and artificial intelligence.

"Now things are much more integrative. I think that's just a fantastic thing. It's one of the things I really like about the AgBio college here; everyone wants to work together," said Farrell.

Congreves is also grateful for the collegiality of the research team as she thinks of the various elements of soil health.

"If you only looked at individual components of soil, you're not seeing the whole picture. By integrating mul-

tiple soil attributes, we can see how well or not the soil is functioning," she said.

And she notes one other vital role played by the team. Creating a more sustainable future means training the next generation to be mindful of this growing problem and expand this scope of research.

"The most important thing is training students in how to do this. Yes, understanding and modelling soil health is important, but what's more important is training the next generation of people who will be leaders in it."



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Canadian agriculture's \$30 billion opportunity

Farm Credit Canada's (FCC) economics team says rekindling productivity growth in Canadian agriculture is a \$30 billion opportunity over 10 years according to a new report.

"If the agriculture industry can return productivity growth to where it was two decades ago, FCC estimates it would add as much as \$30 billion in net cash income over 10 years," says J.P. Gervais, FCC's chief economist. "Developing innovative solutions, adopting new technology and leveraging data and insights can boost productivity growth and pay off in a big way for Canadian farms."

Canada's agricultural productivity growth has slowed since 2011 which is consistent with global agricultural productivity trends.

Agricultural productivity evaluates how inputs such as labour, capital, land, fertilizer and feed are efficiently transformed into outputs such as crops, livestock and aquaculture products. Productivity growth happens when producers increase their output using the same or smaller quantities of inputs.

Total factor productivity measures the combined effects of new technologies, efficiency improvements and economies of scale. It is a key metric for assessing trends in agricultural productivity.

"Between 1971 and 2000 there was steady productivity growth on Canadian farms before hitting a plateau," explains Gervais. "We are now seeing declining growth with a further decline projected for the next 10 years. While that is the current projection, the entire agrifood supply chain can rally around the innovation spirit of farm input manufacturers and suppliers, farm operators, researchers and food processors to restore growth in agricultural productivity towards its peak."

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Canadian agriculture's \$30 billion opportunity

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Average annual total factor productivity growth in Canadian agriculture by decade

Figure 1 showing average annual TFP growth in Canadian agriculture by decade

As a global leader in growing, processing and exporting safe and reliable food, Canadian producers have a long history of adopting new technology and production practices that feed the world and protect the environment.

"The world's population is expected to reach nearly 10 billion people by 2050. The Canadian agriculture industry is well positioned to be a leader in the technology and innovation that will meet that demand for food," says Justine Hendricks, FCC president and CEO. "At FCC we offer a full complement of financing services and resources to support the industry in sustainably increasing its productivity and maximizing the resulting economic gains."

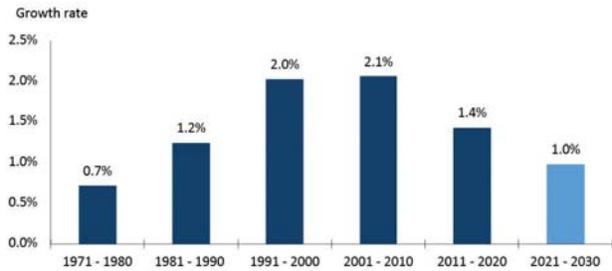
The \$30 billion opportunity that exists for the industry by restoring productivity growth to its historical peak is calculated using a framework that takes into account

the relationship between total factor productivity, farm product prices and farm input prices.

"I have confidence in the agriculture industry's ability to enhance productivity growth," said Hendricks. "FCC is dedicated to supporting our customers as they meet these new demands and pursue productivity improvements through a variety of operational shifts designed to reduce input costs and maximize efficiencies."

FCC is Canada's leading agriculture and food lender, dedicated to the industry that feeds the world. FCC employees are committed to the long-standing success of those who produce and process Canadian food by providing flexible financing, AgExpert business management software, information and knowledge. FCC provides a complement of expertise and services designed to support the complex and evolving needs of food businesses. As a financial Crown corporation, FCC is a stable partner that reinvests profits back into the industry and communities it serves.

For more information, visit fcc.ca.



Sources are USDA database on agricultural productivity and FCC calculations.

Ducks Unlimited Canada announces partnership with FCC's Sustainability Incentive Program

BY KARLI REIMER
DUCKS UNLIMITED CANADA

Ducks Unlimited Canada (DUC) is announcing a partnership with Farm Credit Canada's Sustainability Incentive Program.

This new incentive program will complement DUC's Marginal Areas Program on the Prairies. Producers who participate in the Marginal Areas Program in Alberta, Saskatchewan and Manitoba are incentivized to convert unproductive cropland into a more biodiverse state by planting perennial forage.

"Producers who are taking advantage of our Marginal Areas Program are already having success turning land that isn't as productive as they would like into habitat that offers additional benefits," said Kristine Tapley, national lead for sustainable agriculture at DUC. "We are proud to partner with FCC to offer even more of an incentive for producers to consider what works best for their operations and allow them to maximize the full potential of their land."

The Marginal Areas Program targets areas that are unproductive due to poor drainage, soil conditions, periodic flooding, inaccessibility, or salinity. DUC offers an

incentive upfront for participating in the Marginal Areas Program through a 10-year agreement to assist producers with the cost of establishing perennials and alleviate the financial burden associated with land management.

In addition to the DUC payment, FCC customers who are participating in the Marginal Areas Program can now receive an incentive payment based on a percentage of their total owing with FCC capped at a maximum payment of \$2,000 or \$50/ acre of enrolled acres.

"Canadian grasslands are some of the most endangered ecosystems in the world. This incentive program is an opportunity for producers to provide natural habitats for wildlife and enhance biodiversity responsibly," said Curtis Grainger, FCC director of sustainability programs. "We hope to encourage seeding marginal areas that are unproductive to perennials, helping to improve profitability, pollinator habitat and act as buffer zones."

By sustainably managing areas with unproductive cropland through this program, producers are financially incentivized to contribute to environmental enhancements, which positively impact biodiversity while

offering a solution to local land management challenges.

DUC is the leader in wetland conservation. A registered charity, DUC uses sound science and partners with government, industry, non-profit organizations, Indigenous Peoples and landowners to conserve wetlands that are critical to waterfowl, wildlife and the environment. To learn more about DUC's innovative environmental solutions and services, visit ducks.ca.

FCC is Canada's leading agriculture and food lender, dedicated to the industry that feeds the world. FCC employees are committed to the long-standing success of those who produce and process Canadian food by providing flexible financing, AgExpert business management software, information and knowledge. FCC provides a complement of expertise and services designed to support the complex and evolving needs of food businesses. As a financial Crown corporation, FCC is a stable partner that reinvests profits back into the industry and communities it serves. For more information, visit fcc.ca.



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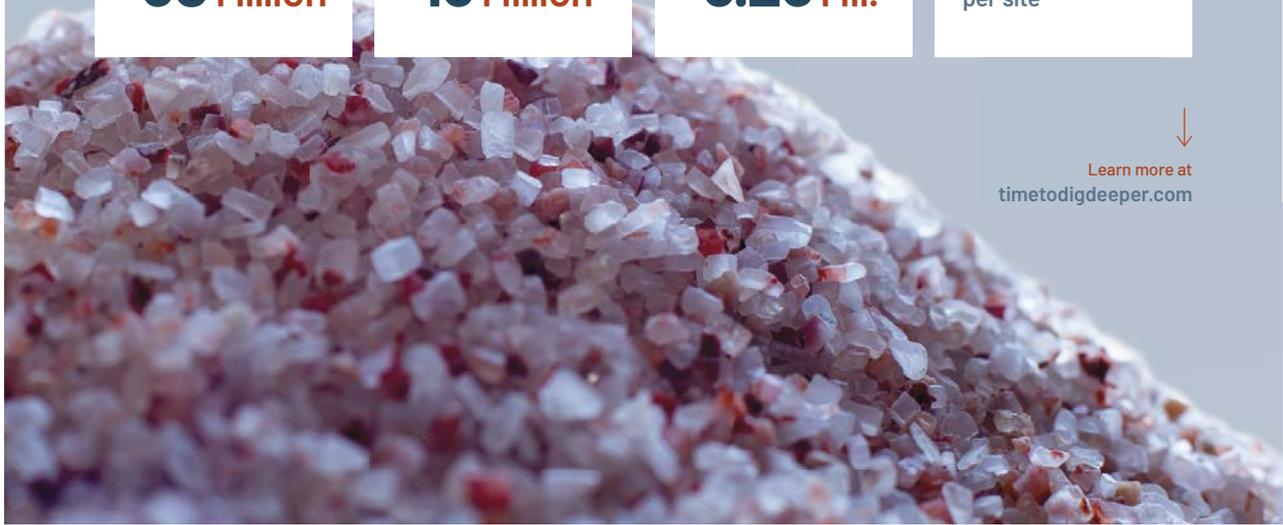


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