USASK COLLEGE OF AGRICULTURE AND BIORESOURCES MAGAZINE 2021

AGKNOWLEDGE

Growing the Future

UNIVERSITY OF SASKATCHEWAN
College of Agriculture and Bioresources
AGBIO.USASK.CA


The future is in farmers' hands.
It could be in yours too.
The world needs a new generation of thinkers.
We need you. Join the BASF Agricultural Solutions Team.
At BASF, we provide advanced solutions and agronomic advice to help growers farm today and into the future. We offer university and college students a wide variety of summer internships and roles upon graduation across disciplines including research, agronomy, technical services, sales, marketing and more. If you are up for the challenge, we want to hear from you. Visit basf.ca to learn more.
BASF
We create chemistry
© 2020 BASF Canada Inc.

Contents

USask • College of Agriculture and Bioresources • 2021

Cover photo: Inside the Agriculture Greenhouses on campus, 42,000 plants are growing.
Photography by Christina Weese.

AGKNOWLEDGE

UNIVERSITY OF SASKATCHEWAN
College of Agriculture and Bioresources
AGBIO.USASK.CA

Editor
Brett Makulowich
Communications Co-ordinator
College of Agriculture and Bioresources

Contributing Editor
Hamish Tulloch
Director of Development
College of Agriculture and Bioresources

Art direction/design
Deanna Miller
Deanna Miller Design

Printer
Mister Print

Publication Date
Fall 2021

Published by the College of Agriculture and Bioresources, USask

We acknowledge we are on Treaty 6 Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another.

Use of the University of Saskatchewan logo is regulated by the University of Saskatchewan Board of Governors and is protected under section IX of the Canadian Copyright Act.

The College of Agriculture and Bioresources and the University of Saskatchewan make no expressed or implied warranties of merchantability or fitness for a particular purpose or otherwise, concerning the use of any product, statement, and advice provided, and assumes no liability for any injury or damage, direct or consequential, which may be incurred from the use of such products or services herein.

Contact
College of Agriculture and Bioresources
University of Saskatchewan
51 Campus Drive
Saskatoon, SK S7N 5A8
Phone: (306) 966-4056
Fax: (306) 966-8894

@agbiousask

INTERNATIONAL YEAR OF
FRUITS AND VEGETABLES
2021

Dean's report

Dr. Angela Bedard-Haughn (PhD)

This past year – my first full year as Dean of the College of Agriculture and Bioresources – has been characterized by change and challenges.

Between the constant change and challenges brought on by the COVID-19 pandemic and the obstacles of a remarkably dry growing season throughout much of the Prairies, we have been forced to adapt, and then adapt again.

Interestingly, the theme of the college's strategic plan which outlines our goals to 2025 is "Adapting to Change". Written pre-COVID, it was conceived out of a recognition that we are increasingly called to adapt to changing economics (both locally and globally), to changing climates, to changing technologies and to changing student needs. As we look back on the past year and look forward to this year, we can reflect on just how apropos that theme was.

Last year, our research and teaching activities adapted to continue to thrive while keeping our faculty, staff and students safe and healthy. We found new ways to stay connected to the stakeholders and communities we serve. This year, we are adapting to a new approach yet again, as we strive to provide a working and learning environment that is both safe and supportive.

We are excited to be growing our future, by implementing new ideas such as a new lecturer who will help us adapt the core curriculum of our BSA program to better serve the needs of our students and their future employers. Later in this issue of Agknowledge, you'll read about the search for a new research chair, which is supported by a truly innovative partnership among the university, industry and government.

At the same time, though, our adaptation comes from the strength that we have built over more than a century, a century full of ample challenges. Our college and the community it serves are rooted in tradition, and we are proud to be building upon the success of our roots as we grow our future. In 2021, we are celebrating 100 years of horticulture science at the University of Saskatchewan (USask) and 50 years of the USask Crop Development Centre.

Now more than ever, we look forward to continuing to adapt and grow the College of Agriculture and Bioresources in new ways: to be the college the world needs.

2020-21 Year in Review

Adapting to change in extraordinary times, the College of Agriculture and Bioresources is growing the future.

1,703 Students

1,385 Undergrad

318 Graduate

315 Staff

80 Faculty

$33.6 million

New awarded research funding

$1.5 million

Scholarships, bursaries, awards

42,000

Plants growing in the Agriculture Greenhouses

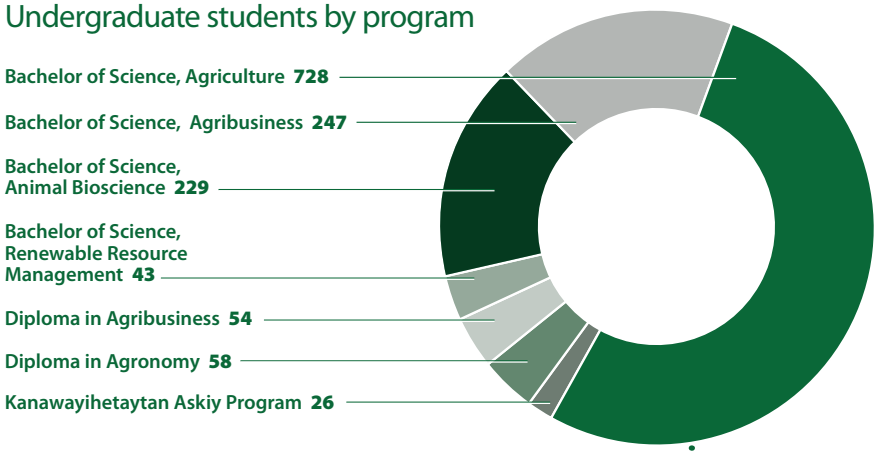
16

New crop varieties licensed by the Crop Development Centre

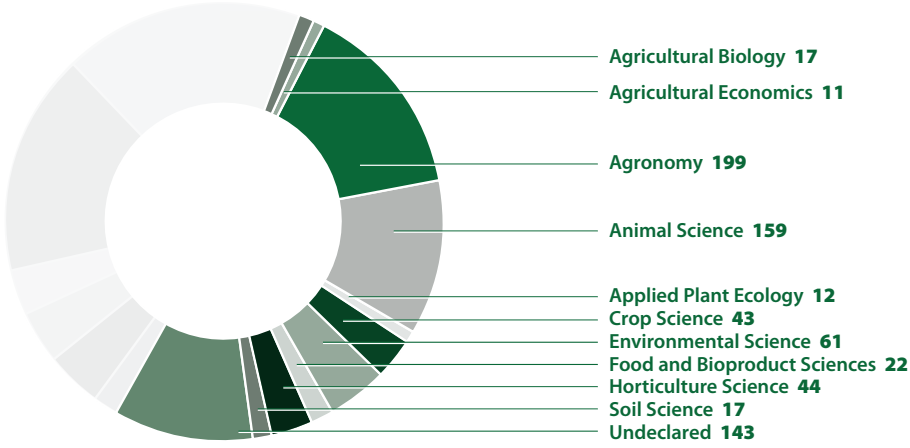
25

Virtual coffee rows held for students to connect during the pandemic

Undergraduate students by program



Bachelor of Science, Agriculture students by major



Supporting farm and family

Alumna Tiffany Martinka switched lanes from a corporate agriculture career to advocacy.

JOANNE PAULSON

Tiffany with her sheep

To say Tiffany Martinka's life is all about farming is both an understatement and not entirely true.

There is one thing more important, and that is family.

Martinka plunged into an agribusiness career after graduating from the College of Agriculture and Bioresources in 2008. But when her daughter was born four years ago with a rare form of epilepsy, she knew she would stay at home on the farm full-time.

"At six months of age, she had her first seizure," Martinka said in an interview. "She was ultimately diagnosed with a severe form of epilepsy called Dravet syndrome."

"I was coming up to the end of my mat leave and her seizures were nowhere near controlled. Being in rural Saskatchewan, there are not a lot of options for childcare, let alone special needs childcare."

"I had to quit my career to stay at home on the farm to care for her. That was four years ago in November that I officially quit my job."

Yet when a door closes, a window opens. When she was working full-time and raising her two older children, now 10 and seven, it left little time for her other passion: farm advocacy. Now home with her daughter at her side, she has been able to embrace it.

Martinka and her husband, Lane, operate a chicken farm in northeastern Saskatchewan near St. Benedict. One of 68 chicken farms in Saskatchewan, it produces 100,000 chicks per flock and six to seven flocks per year; they also seed 2,000 acres of grainland.

"My husband grew up here; this is the family farm my husband grew up on. I actually grew up in Weyburn. I met my husband in university; he was getting his agronomy degree. We settled close to the farm and then we had a five-year succession plan with my father-in-law. It's been seven years since we transitioned."

"We were farming with two uncles and we're now 50-50 partners with an aunt and uncle, Laverne and Colleen Martinka."

Marinka also grew up on a grain and cattle farm and was very involved with the family operation and in 4-H. Early on, she knew her career would be in agriculture.

"The reason I wanted to go into agriculture was because I knew that we all need agriculture in our lives every day . . . in every part of the world. At that age, I didn't know where I would end up. I

Photography by Alicia Marie

thought maybe I would travel, and I wanted to go into an industry where that might be possible."

"I didn't know exactly what job I wanted to do, but I knew the possibilities would be endless. Because we all need to eat, right? It's such a diverse industry and that's what led me to agriculture."

She enrolled in the College of Agriculture and Bioresources, starting in economics; but she graduated with a degree in agribusiness, a specialty created by the college when she was in her second year.

"I was really interested in marketing and the business side of things. It was such a great program; I really enjoyed it. I really enjoyed the mixture of commerce classes as well as the agriculture classes."

After graduation, she worked for the Canola Council of Canada as an agronomy specialist and then for Monsanto as a territory account manager.

Now, "my special needs daughter is my primary role," she said. "Advocating and sharing our farm is something we can do right here; she can do it with me, alongside me."

She started an Instagram account called Prairie Pretty, began writing a blog, and worked to expand her advocacy horizons.

"I started looking at opportunities I could do as a farmer . . . and participated in the Chicken Farmers of Canada young farmer program. I was one of five chicken farmers chosen from across Canada to participate . . . and being part of this program, I was able to travel to Ottawa, learn a lot more in-depth about our chicken industry . . . and that has really helped with my advocacy."

"I started doing more advocating on my Instagram account. It's really gotten a good amount of traction. I work closely with Farm and Food Care Saskatchewan, and I work closely with Chicken Farmers of Saskatchewan (CFS) and Chicken Farmers of Canada."

She now serves as the CFS director for Farm and Food Care after being awarded its champion award in 2020. Martinka has also given presentations to a Dieticians of Canada conference, to parliamentary interns from Ottawa, and a Federal Municipalities of Canada conference.

Being home on the farm has allowed her to pursue other opportunities, and one of them has been thoroughly embraced by her children. She recently started managing a small flock of Olde English Southdown "Babydoll" sheep. They stand a mere 24 inches high at the shoulder.

"I wanted to get animals for the kids and decided on sheep," she said. "I looked on Kijiji and thought, oh my gosh, that is what we need."

She sourced the very rare little animals from a breeder who was retiring and dispersing her flock. Martinka took half of it; she now has 15 breeding animals and sells the lambs.

"It's a niche market for these sheep. They are primarily used for hobby farms and acreages as pets and to eat the grass around acreages as well as used for someone to keep for spinning their own wool."

Her passions spring from a desire to connect farming with the rest of society.

"I want consumers to have a connection to their farmers," she said. "In past generations, people used to grow up on the farm. Then the next generation they had grandma and grandpa to go visit on the farm. As generations go by, there's less and less connection to that farm."

"Now only three per cent of Canadians are involved directly in primary agriculture.

Tiffany with her family

Photography by Damara Lynn Photography

That is not a lot of people. And farmers are often humble people who like keeping to themselves on the farm; there's a reason why they like this lifestyle, so there's even less of that three per cent that speak up about what we do."

"It's so important to offer that connection to the farm. People deserve to know where their food comes from."

Among her other activities are virtual tours of her farm. During the pandemic, many people pivoted to using Zoom for meeting and connecting, and she took advantage of the online service.

"It was a way for me to offer virtual tours. Because of biosecurity reasons we can't just walk everybody through our farm," she noted.

"This past June, I offered a year-end virtual field trip for Saskatchewan classrooms. I presented to over 100 classrooms. It was so much fun; it was so neat to get that kind of response."

"I think that demonstrates that there's a need for this sort of information, this sort of connection."

Uncovering the secrets climate change

Photography by Christina Weese

of the earth to mitigate

ASHLEIGH MATTERN

In a teaspoon of soil, there are more microorganisms than humans on Earth. One teaspoon has billions of microbes, and tens of thousands of different kinds.

That complexity is a challenge for soil microbiologists like Dr. Bobbi Helgason (PhD), associate professor in the Department of Soil Science at the University of Saskatchewan (USask).

She works in agricultural systems looking at microorganisms in the soil and microorganisms associated with plants to better understand how they support nutrient cycling and plant growth.

One area of particular focus for Helgason is soil carbon.

"Soil carbon is a really hot topic because of its importance for mitigation of climate change," she said. "We know that soils store a lot of carbon—they're important sinks for carbon dioxide removal from the atmosphere—and soil microorganisms are important agents of the amount and form of carbon stored in the soil.

"It's a positive thing our agriculture systems do for society, and more broadly, it's an important mechanism of combating climate change. Soil carbon, the backbone of soil organic matter, is also at the heart of soil fertility. It is critical for healthy agroecosystems."

She's working to understand how to optimize and promote the processes that stabilize carbon in the soil.

With soil carbon sequestration, plants capture carbon dioxide in the air and build it into their tissues. Later in the plant's life cycle, that carbon gets sequestered in the soil through the process of microbial decomposition, Helgason said.

"Soil carbon change boils down to inputs minus outputs equals change in storage," she said. "We can either increase plant growth or other types of carbon we might apply to the land, or we can decrease their decomposition."

Microbes have some similarities to us humans. When we ingest carbohydrates and metabolize the energy in that food, it creates carbon dioxide, some of which we breathe back out. Microbes are doing the same thing, Helgason said.

"They're taking plant tissues and consuming them. When they consume them, they build some of that plant carbon into their own cells … When they die, those carbon-containing molecules can become stabilized in the soil. If microbes grow inefficiently, most get respired back into the atmosphere."

Farmers can promote more efficient microbes by managing the soils differently. That might mean reduced tillage, or changing the crop rotation because, Helgason said, "microbes like a balanced diet."

"Some microorganisms are more efficient than others," she said. "So we can use the way we manage our agricultural systems to try to enhance the activity of the efficient ones and keep more carbon in the soil."

Opening the black box

Carbon is everywhere but it can be difficult to follow below ground because we can't see it, Helgason said. The earth is a black box.

But advances in science are changing that.

The university has built capacity to use a stable isotope tracer—a form of carbon with an extra neutron—making it easier to detect with specialized equipment.

Helgason and her research team have been labelling plants with that tracer and then following the decomposition of the molecules. The plants are put in a special growth chamber where the atmosphere is filled with this tracer.

"The plants go along and do their usual photosynthesis and incorporate that tracer into their molecules just like any other carbon atom," Helgason said.

Tracking the carbon in this way allows the researchers to create experiments where they can manipulate the conditions to find ways to keep more carbon in the soil.

"Unpacking something so complex is difficult, but with these tracers we get a clearer picture of which [microbes] are important for promoting carbon stabilization."

Looking at roots in particular offers some helpful clues, Helgason said. Living plants feed the microbes around them; the carbon exuded from the roots feeds the microorganisms, which in turn returns resources back to the plant in a synergistic relationship.

"We can look at how much root carbon gets deposited by crops of different species. … Because of the size and the nature of different rooting systems, they not only put more or less carbon below ground but it gets there in different forms."

The positive benefits of agriculture

Helgason has always had a fascination with farms. She was born and raised in Saskatchewan on a grain farm near St. Gregor, Sask., about 135 kilometres east of Saskatoon.

"Every time I drive in rural Saskatchewan in the summer, I find it remarkable how much food we produce here," she said.

"Understanding how we can do that in the most positive way, both for the success of farmers themselves and society in general, makes this an exciting place to build a career. And because microbes have so much to contribute to sustainable agriculture, there are many avenues of fascinating research to explore."

Throughout her career, she's worked on soil biological processes. She did her bachelor's and master's degrees at the College of Agriculture and Bioresources, then moved to Lethbridge, Alta., to take a job with Agriculture and Agri-Food Canada. She came back to USask to complete her PhD.

Using molecular biology and researching DNA for these types of applications was just emerging when she was an undergrad student, a shift from traditional culture-based microbiology.

"The number of tools available to us to understand these complex processes has exploded," she said. "We're always building better capacity to dig deeper and understand more."

It's cutting-edge work that she said keeps her on her toes.

"It's a continually changing challenge, but it's exciting. We are talking about a complex ecosystem, so all of this increased precision allows us to dig deeper and understand more."

She also appreciates the collaborative nature of the work; her area of study connects her with a wide range of other scientists and professionals.

"The microbial piece is just one part of the equation," she said.

Her work includes understanding how to implement the research on farms, making it an important part of maintaining and enhancing long-term productivity of soil systems, as well as preserving and enhancing the health of our agricultural ecosystems and all of the adjacent ecosystems that they impact.

"Carbon storage is one of those very positive benefits that agriculture plays for society. By storing more carbon in the soil, our goal is to enhance climate change mitigation and build healthier soils," she said.

Dr. Bobbi Helgason (PhD)

Improving the sustainability of the beef industry through applied research

ASHLEIGH MATTERN

Photography by Lana Haight

Ribeiro Lab. Left to right from the top: Tyen Paterson, Nikita Payne, Dr. Gabriel Ribeiro. Bottom: Jenna Sarich and Phoebe Johnson.

There is mounting pressure on the beef industry to be more efficient and use less resources, said Dr. Gabriel Ribeiro (PhD), assistant professor in the Department of Animal and Poultry Science and the Saskatchewan Beef Industry Chair.

"I'm trying to make sure producers can continue to produce in a sustainable way, and make sure they can improve their efficiency," Ribeiro said.

Through his work, he wants to help producers use their resources in the best way possible, and make sure animals stay healthy while converting those resources efficiently.

He recently finished an animal study looking at the impact of ergot alkaloids in feedlot cattle diets. Ergot alkaloids are produced by a fungus that infect cereal grains during the flowering stage.

"We've done some work trying to understand the impact of that in beef cattle, on the health side, and growth and performance of the animals."

The study was undertaken at the Livestock and Forage Centre of Excellence at the

"Cattle are better than any other species at efficient use of those byproducts."

DR. GABRIEL RIBEIRO (PHD)

University of Saskatchewan (USask) and compared the impact of different levels of ergot alkaloids in cattle's diet, including below recommended levels and near maximum recommended levels, according to the Canadian Food Inspection Agency.

"Even levels below what should be a maximum limit to feed animals, we can still see animals having issues with reducing their performance, reducing their intake and their weight gain," he said.

"We're pretty excited with this data and results of this research because we can advise producers and improve legislation and regulation."

His master's student Jenna Sarich is leading that research.

The research is important because producers want to know what level of contamination of their grain they can have in the diet of the animal without impacting the health of those animals. And it's going to become more important to understand how it affects animals because ergot alkaloids are impacted by climate change. With the changing weather, he said more contamination of cereal grains is expected.

Cattle have a special ability to eat lower quality feedstuffs in a way that humans can't. Ribeiro said that most of the barley grown is meant for the malting industry, but about 70 per cent doesn't meet the standards for human consumption and gets downgraded to animal feed. Similarly, distillers' grains from the fermentation of corn or wheat is a byproduct rich in protein and fibre, which can be dried or pelleted to produce feed.

"Cattle are better than any other species at efficient use of those byproducts," Ribeiro said.

"When we look at the benefits of having cattle around, they're using a lot of feed that doesn't meet human quality standards and byproducts from industry."

But at certain levels, it can still have a negative impact on the animal, so it's important to understand what those levels are.

Reducing the environmental impact of beef

Another project Ribeiro is working on with a different master's student, Jenilee Peters Tarasoff, is to develop an easy way to estimate the intake of beef cattle in the pasture, with the goals of selecting more efficient animals and being able to adjust the diets of the animals.

"In grazing animals, it's really hard to get that information," he said. "All the methods we have are crude and it's hard to get individual animal intake. Usually we have an assessment of a group of animals but that is an estimate, so still not a really good number."

In this research, they are trying to use near infrared spectroscopy (NIRS) of the feces of the cattle to provide that information. They're in the process of developing calibrations that will allow them to correlate the findings with the animal's intake.

The first stage of that project has been a very controlled study where they're collecting the data that will help them create a tool for producers.

"It takes less than a minute to scan the feces of those animals in the NIRS machine and we can quickly estimate how much they are eating, how much they are digesting, if we think there's a nutrient in the diet they aren't consuming enough of, we can then adjust that."

Ribeiro's goal is to develop a tool for producers that's easy to use, fast and cheap. Once it's developed, the tool will give producers the ability to rank the animals by how much they are eating and how much they are converting that feed into meat — something that's labour intensive and limited with current practices.

If producers understand how much the cattle are eating, and how much of that food they're converting to meat, they can select animals for breeding that are more efficient.

More efficient animals mean you would need less feed or less grazing area for the same number of animals, reducing the environmental impact of beef cattle production and helping the producer's bottom line.

Pasture-fed animals also don't always get all of the nutrients they require for optimal health, and this process would allow producers to supplement the animals more precisely, Ribeiro said.

A 10,000 kilometre journey

Ribeiro hails from the state of Minas Gerais in Brazil. It's an inland state in the same area as the states of Rio de Janeiro and São Paulo. He's from the capital city of Belo Horizonte, but he said his family is involved in farming cattle.

"I was always helping out and working with the farm," he said. "When it came time to do university, I wanted to do veterinary school."

While earning his veterinary degree at the Universidade Federal de Minas Gerais, he had an opportunity to do some research on ruminant nutrition with the animal science department, sparking an interest that led him to complete his master's and PhD on that topic.

He was first introduced to Canada in 2012 via a Brazilian federal scholarship that funds international research. He also worked in Lethbridge, Alta., for Agriculture and Agri-Food Canada as part of his PhD.

When a colleague in Lethbridge invited him to continue to work with him after Ribeiro's PhD was completed, he agreed.

"I was excited to go back because I had a great experience in Lethbridge," he said.

He did a post-doctorate in Lethbridge, and then got a job as an assistant professor at the University of Calgary in 2018.

Ribeiro was drawn to the position at USask because it came with the industry chair and the university had recently unveiled its new beef research facility. He joined USask in September 2019.

"When I first went to Lethbridge, I never thought I would be living in Canada," he said.

He was looking to learn a lot and to go back and work in Brazil, but there were good opportunities for work in Canada and he enjoyed the industry and the people working in it.

As the Saskatchewan Beef Industry Chair, he works closely with producers to answer their needs, and he said he enjoys helping producers and the beef industry in general.

He also enjoys teaching and working with students.

"It motivates me to continue to work with this exciting industry and push forward," he said.

Crop Development Centre launching new look to celebrate a half century of success

✎ NYKOLE KING

Photography by Christina Weese

CDC flax

The Crop Development Centre (CDC) at the University of Saskatchewan (USask) is a powerhouse of research that's propelled Canadian agriculture forward for five decades—and it shows no signs of slowing.

For 50 years, the CDC has developed seeds of new varieties that become the crops of tomorrow. For every seed variety, scientists are keenly aware it can take 10 to 12 years of rigorous testing before it's planted in a farmer's field.

Always keeping "an eye to the future" is what Dr. Curtis Pozniak (PhD), the director of the CDC, credits to the success of the CDC's research and seed breeding operations. Even while celebrating the major milestone year, Pozniak and his team are planning for the next half century and positioning the CDC as a world-class research centre by launching a rebrand.

"The idea to rebrand the CDC is to celebrate our connections, our history and our people, but also to look to the future, and better position and communicate the importance of the work we do," says Pozniak.

The CDC is a field crop research centre founded in 1971 under the Department of Plant Sciences in the College of Agriculture and Bioresources. The CDC is an integrated centre within the Department of Plant Sciences and works closely with stakeholders and industry partners to develop profitable seed varieties that are particularly suited to withstand the harsh prairie climate.

CDC durum wheat

CDC peas

At the CDC, scientists and field technicians develop commercially successful and diverse varieties of bread wheat, durum, barley, oats, flax, field peas, lentils, chickpeas, canary seed and dry beans. More recently, the CDC has expanded its activities and developed new forage varieties to support a growing livestock sector. The centre has produced more than 500 seed varieties to date, which are sought out by producers across the world.

Researching crop improvement is only part of the CDC's operations. Marissa Janssen is the manager of the CDC, and much of what she does is handling the licencing agreements to sell seed to producers. Janssen has been working with Pozniak on the rebrand, which she hopes will bridge the research and the business side to bolster the profile of the CDC.

"Overall, my goal is to raise awareness of the work of the CDC, particularly during the 50th year, but also beyond that. We have so much to celebrate; our past, our people and our future. It is timely to highlight the excellent research that we do and to use our success to really build more brand recognition," says Janssen. "We've done a great job and I think we can continue on that … and really set the CDC up for another 50 years of success."

The launch of the rebranding will take place this fall. The rebrand includes a new CDC logo and the launch of a redesigned website and social media channels.

"We know who we are, and we are proud of our accomplishments. Our new branding and communications strategy will allow us to talk about our research in a way that people understand and to bring it more to life for people," says Janssen.

According to a 2016 economic assessment, for every dollar invested into the CDC it results in a return of $12 to the economy. The goal with rebranding is to raise its profile as a research organization—one that is a key contributor to the local, regional, and national economy. It will be an ongoing task to better communicate with the public, especially to urban dwellers, just how vital the CDC's operations are to food production in Canada.

"There are a lot of people that know exactly what we do, but there are also many that have little idea of the importance of crop breeding and research. I think that is one part of what we want to focus on in the next few years—reaching the urban dwellers group because it's important that people know what we do," says Janssen. "We create the seed varieties for farmers around the world to grow into safe, nutritious food."

The research operations of the CDC are diverse, from crop breeding, developing disease and pest resistance into the seeds they produce, deciphering the nutrition and user-quality of new varieties to genomic research of sequencing crop DNA. Pozniak says that the CDC's priority will remain the profitability and sustainability of producers and the ag sector, which is why CDC scientists work together with researchers at the College of Agriculture and Bioresources to implement sustainable production systems.

Moving into the future, Pozniak says that supporting sustainable production systems through variety development will continue to be a priority, along with consumer's needs of nutritional quality and the growing threat of extreme climate and weather.

"New varieties must meet the needs of growers and the agronomic systems they use to realize the potential of those varieties. The strength of the CDC has been, and will continue to be, our collaborations across an array of disciplines in the Department of Plant Sciences, the college, and the university. Things like research into agronomy, digital agriculture, stress physiology—these are all really important to help CDC research develop resilient varieties for the future," says Pozniak.

The success of the CDC also comes from collaborating with partners with diverse perspectives across the value chain so that their work has greater global impact, explains Pozniak. It also allows them to keep a balanced funding portfolio.

"It has always been and will remain our strategy to work with a number of stakeholders from across the value chain. Each group has a very different perspective of the industry but when you actually bring them together, the whole is greater than the sum of its parts," says Pozniak.

"It has always been and will remain our strategy to work with a number of stakeholders from across the value chain."

DR. CURTIS POZNIAK (PHD)

The milestone marks a distinct new phase in the research organization's history, in raising its profile and recognition as a world-class research centre that's tackling the most pressing issues in food security, health and sustainability.

"The CDC is a tremendously successful organization, and I hope to see that the CDC becomes even more internationally recognized as a leader in crop research, and really a household name across the country," says Janssen. "I think it absolutely can be, and that's what I hope for the CDC."

CROP DEVELOPMENT CENTRE
USASK

The new Crop Development Centre logo

Unlocking the genetic mysteries behind beef

Dr. Mika Asai-Coakwell (PhD) shares her passion about genetics.

✎ JANE CAULFIELD

In the late 1990s and early 2000s, thanks to several prime-time dramas, getting a career in forensics went through a bit of a revitalization. And for Asai-Coakwell, who had just completed an undergraduate degree in biology and archaeology at the University of Saskatchewan (USask), the idea of using science to solve a mystery was exciting.

Photography by Christina Weese

Dr. Mika Asai-Coakwell (PhD)

"I wanted to gain experience working in a DNA lab after my degree, so that's when I approached the animal and poultry science department and talked to Dr. Sheila Schmutz," she said. "I worked as a summer student and then as a grad student and thought I would go on and work for the RCMP or something similar."

Now an assistant professor in the Department of Animal and Poultry Science, Asai-Coakwell said that the work she did during her master's degree on cattle genetics, also at USask, showed her a whole new world of mysteries to be solved.

"When I started the research, I totally fell in love with that part of the work," she said. "When you're looking at genes, you're still solving a puzzle. Maybe even one that you didn't know was there. That's when the crime fighting dreams turned into dreams of gene discovery."

From ocular genetics to bovine genetics

After completing her PhD at the Swiss Federal Institute of Technology in Zurich, Switzerland, Asai-Coakwell returned to Canada, landing in Edmonton with her husband who was stationed as a pilot in the Royal Canadian Air Force. While there, she took on a post-doctoral fellowship at the University of Alberta, conducting research on ocular genetics. She said that while it may not be an obvious jump from eyes to cows, it was a doorway towards her current work in livestock genetics.

"The group of genes that I was working on in ocular genetics is heavily involved in different aspects of livestock genetics. So, it just carries over as an overarching family of genes – it's really quite fascinating," she said. "That's really the beauty of DNA – it spans across species. If there's a gene that's really important in a developmental pathway, it will most often be the same gene across

all mammalian species, if not across all vertebrates."

Currently, Asai-Coakwell is working on a couple of research projects that seek to understand the genetics behind specific traits of beef cattle and ultimately support producers. One project examines variations in gestational length in cows.

"We want to identify the areas in the cattle genome that are associated with that trait and understand what causes the differences," she said.

From a practical perspective, an extra-long gestational period can lead to calves growing too big, causing birthing problems and higher cow/calf mortality rates. A gestational period that is too short can lead to really weak offspring.

"We hope that this work can directly benefit our producers in this province," she said. "We hope this new information can help them better plan and establish herds that rely on that perfect combination between sire and cow that will lead to the establishment of healthy gestation periods."

Another project in the works sets out to discover and examine what genetic traits lead to overall efficiency of a cow.

"We want to know what genetic traits highlight how one cow is much better than another – from how they forage to successfully birthing healthy calves every year," she said. "What's really interesting is that these cows can be on the same pasture and are getting pregnant from the same sire every year. So, what's causing these differences?"

She said this project is collaborative in nature, leading to exceptional opportunities for researchers across the college to work together.

"When looking at efficiency, you can't just look at genetics. There's nutrition, there's physiology, there's the environment, there's the gut microbiome, and there's herd management – genetics is just a small part of it," she said. "This means that we have to collaborate, and that's really exciting."

For the love of research with impact

Asai-Coakwell said that while the work she does has academic implications, she finds a lot of reward in knowing that her research also has meaningful real-world applications.

"Genetics for beef cattle is really relevant for Saskatchewan. We have a lot of cow/calf producers across the province and that's really where we need to have that research in that area," she said. "Beef cattle genetics and looking at the variations of the DNA associated with traits such as muscle and bone growth has economically important implications."

Asai-Coakwell and her team looks to work with industry experts and producers to help them understand their herds better, plan accordingly, and cultivate success.

"They see their animals every day, they know exactly what I am talking about. It's not a huge step for them to go down and think about how it's working at a genetic level because they see it at the whole animal level," she said. "It's very rewarding to have the ability to see that our results can be implemented into a test that will ultimately improve the industry."

This kind of real-world application isn't limited to Saskatchewan's borders and can lead to long-term changes to the beef industry around the world.

"We might not think of livestock genetics as having a global impact, but part of my role is to demystify genetics. Livestock molecular genetics might sound scary, but what we're really talking about is breeding and selection," she said. "This kind of domestication of these kinds of animals is the hallmark of civilization and what people have been doing for thousands of years. Breeding and genetics just go hand-in-hand."

She said the difference between now and then is the technology. While historically, selection and breeding may have been done by certain visual or behavioural traits, scientists and producers alike can now dig a bit deeper to enhance their breeding programs.

"The advancement with our technologies has given us the ability to look at the molecular part of it – the genome. And connect a specific part of the genome to a specific trait and select towards the desirable ones. That's global because selection and domestication is found on every continent where there's humans."

It might also be a way to ensure the industry can remain successful throughout changing and uncertain times.

"With this technology, we've been able to select at a faster rate. With increasing populations and the evidence behind a changing climate, I think it's more important than ever to really focus on the genes and the genomic regions that are going to allow us to produce livestock efficiently," she said. "That's relevant in Saskatchewan, in Canada and globally. It's going to play a huge role in our food security because we are going to need to provide enough food in a safe, sustainable, and nutritious way that is also competitive and profitable."

Teaching the next generation

Asai-Coakwell's enthusiasm for genetics and her research is infectious – something that makes her an exceptional educator within the College of Agriculture and Bioresources. And it's another part of the job that she loves.

"It's so rewarding to see that next generation of scientists and to train them. I've been really fortunate to have great graduate students who are inquisitive, they're enthusiastic, and they're learning so much."

By working alongside grad students and other curious individuals, her natural (and infectious) excitement for science and genetics continues to grow. It's a trait she believes is necessary when teaching, especially when you're teaching complex ideas and complicated scientific processes.

"I want to ignite this passion for molecular genetics for my undergraduates," she said. "Part of that is being able to show how passionate I am for science and how interested I am in trying to answer these questions or creating new questions that we can answer."

For the love of plants

JANE CAULFIELD

Jackie Bantle brings passion to the role of greenhouse manager.

The agricultural greenhouses on campus are where innovation (quite literally) grows and blooms. For greenhouse and horticulture facility manager, Jackie Bantle, the greenhouses, the horticulture field lab, and all the green spaces she is responsible for are joyful places as well.

"Just seeing things grow – planting something in the spring and seeing it through to harvest; I find that amazing," she said. "I love just watching things grow."

When she first attended the University of Saskatchewan (USask), Bantle got her degree in education feeling sure that she was meant to become a high school music teacher – she loved everything about the subject. But after a year and half of teaching high school students, she realized that career journey didn't fit quite right.

"I really wanted to do something where I was outside," she said. "So, I grabbed the university calendar and saw horticulture and was like 'yeah!' I mean, I liked being with flowers and I liked being outside, so I applied."

She said it was student summer work opportunities and encouragement from professors that helped her find a groove and cultivate a deep love for all things horticulture.

Jackie Bantle in the Agriculture Greenhouses.

Photography by Christina Weese

"At that time, all of us students got to work in a large group at the field lab doing different things – one week on fruit, one week on vegetables and switch around, so it was a really great learning opportunity," she said.

A lifelong passion

After graduating, Bantle landed a technician job working for one of her former professors.

"I remember that when one technician quit, she had been there for 10 years doing potatoes. And I thought to myself that I would never be at the university for 10 years. Now, it's been almost 30 years. I'm a long hauler, "she said with a chuckle.

In those 30 years, Bantle has worked in a few areas, including vegetable research, accepting the role of greenhouse manager more than 10 years ago. For her, the job remains exciting because things must regularly adapt to meet changing needs of the College of Agriculture and Bioresources and its researchers.

"Things have really expanded since I started," she said. "Now, I'm managing the greenhouse and the horticulture field lab as well as the Beamish Conservatory in the Agriculture Building. As I've been doing that job, there has been a lot more opportunities that have come up."

Often, those opportunities are a way for Bantle to represent the college and its horticulture programming across the province, including the Saskatchewan Horticulture Association, The Gardener Magazine, and the Saskatchewan Greenhouse Growers Association.

"I also get to do a little bit of teaching and work with the Horticulture Club, which is what I really like – being around the university students," she said.

A day in the life

A typical day includes running between the greenhouses and the horticulture field lab making sure that not only are things running smoothly, but that everyone has what they need to be successful in their research.

"I really like to think that we are here to support the research and that people have what they need to get their research done. Ultimately help make the work a little bit easier," she said.

But, without missing a beat, Bantle quickly points out that it isn't just a one-woman show and success really comes from the skills and abilities of the team working with her.

"I have excellent people working for me – I'd be lost without them, and I am always very grateful for them. It's not just me doing this," she said. "We have a lot of fun at work and we're always learning new things."

That sense of teamwork and support is common throughout the college and is a vital part towards its success.

"The hard work from Jackie's team and her long-time commitment to the college are evident in the success of our greenhouses and horticulture facilities," said Dr. Angela Bedard-Haughn (PhD), dean of the College of Agriculture and Bioresources. "She is one of the college's 315 staff members – each one vital to the college's mission to advance the responsible use of land, water and bioresources to provide products and services that enhance the quality of life for the people of Saskatchewan and around the world."

"The hard work from Jackie's team and her long-time commitment to the college are evident in the success of our greenhouses and horticulture facilities."

DR. ANGELA BEDARD-HAUGHN (PHD)

A department ahead of its time

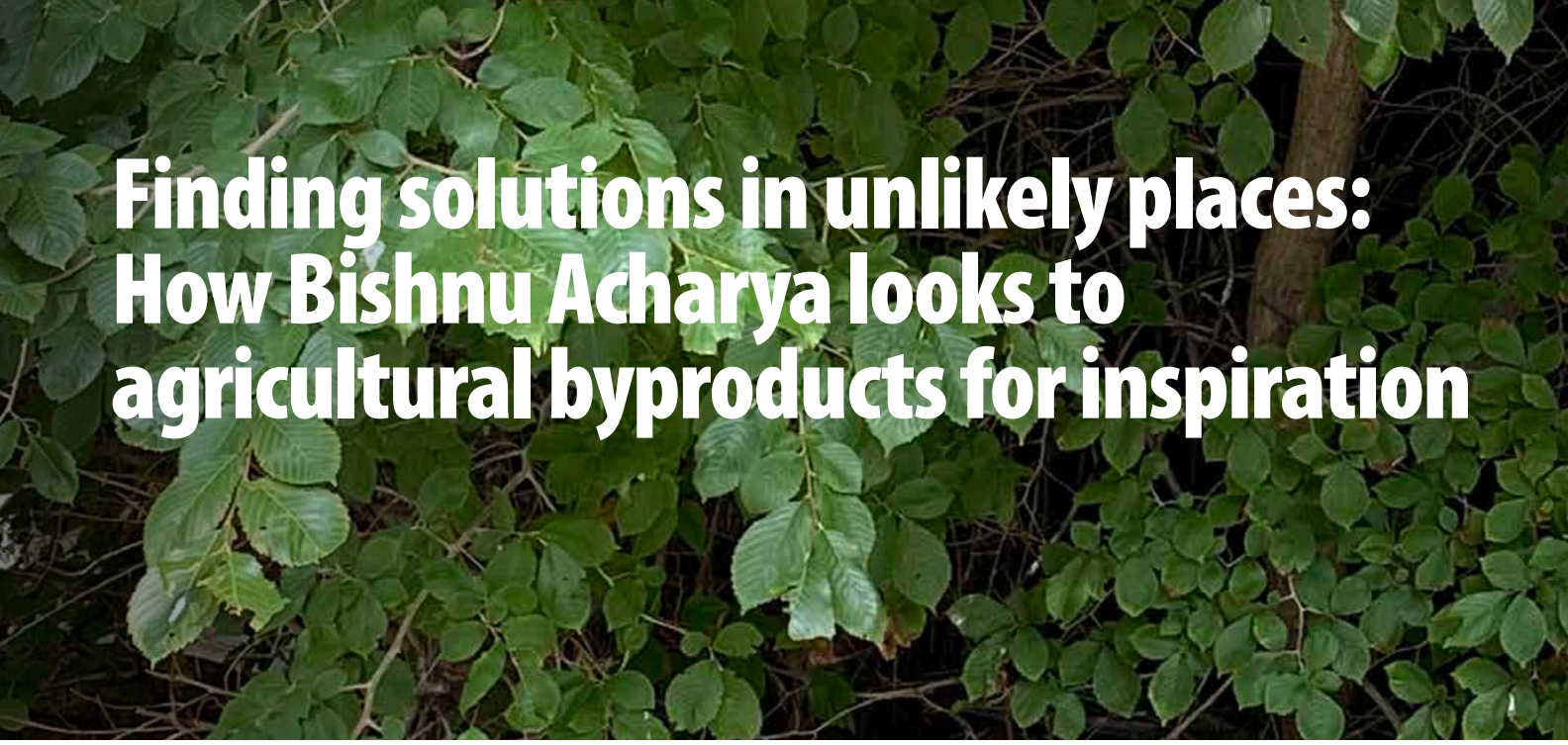
2021 marks 100 years of horticulture science at USask. Something Bantle said is a great honour to be a part of, considering many people don't necessarily associate it with prairie farming.

"In some areas of the world, horticulture is big farming. But you can make a living in horticulture on a small area of land. A 70-acre vegetable farm is a big farm," she said. "But it is also part art – you are making spaces beautiful. So, it's a wider field – part science and part art."

When considering how much money people spend on landscaping, or how most small towns have a golf course to maintain, it's clear that horticulture in Saskatchewan has huge economic impact. This probably is why it was one of the earliest areas of agriculture being taught at USask.

"Horticulture has a really long history in the province," she said. "Maybe because of the amount of labour required for it or our climate that we have, it doesn't always get the recognition it should. But it is an important part of agriculture in Saskatchewan and what we do at the university."

To learn more about *100 Years of Horticulture* webinars and history, visit **gardening.usask.ca/hort100.**



Finding solutions in unlikely places: How Bishnu Acharya looks to agricultural byproducts for inspiration

✎ ASHLEIGH MATTERN

Dr. Bishnu Acharya (PhD) has a knack for finding unique solutions to tough problems.

Acharya's research strategy is to look for ways to create value-added products and processes with sustainable resources. He works with bioresources to find sustainable solutions with commercial potential, and develops the technology, opening up new business opportunities.

"Once you know the problem, you try to understand what the nature of the problem is and what potential solutions to it could be," said Acharya, who is an associate professor in the Department of Chemical and Biological Engineering for the College of Engineering at the University of Saskatchewan (USask). In addition to his work as an associate professor, Acharya is the Saskatchewan Ministry of Agriculture Research Chair in Bioprocess Engineering.

One of Acharya's goals is to replace petroleum-based products with materials created from the byproducts of industrial and agricultural processes.

In agriculture, sustainable food production is a popular topic, and Acharya said most people think about that in terms of nutrient management, water management, and crop development.

"My focus is on the other side—towards converting the huge amount of biomass that is left after the harvesting is complete, into a high-value product," he said. "So basically looking at creating value out of waste."

Turning biomass into high-value products requires the magic of engineering to develop new processes and technology.

A strategy of discovery

Acharya came to his position at USask from the University of Prince Edward Island (UPEI). While working at UPEI, he and his team developed a process to harvest problematic tunicates and use it to create a unique biomass-based material called cellulose nanocrystals that industries like packaging, automotive and aerospace could be interested in. His UPEI graduate student, Matthew J. Dunlop, is looking to build that research into a company for the commercialization of technology and products.

Acharya started at USask in September 2020, and is already involved in projects in Saskatchewan that mirrors the strategy he applied in P.E.I.

In one project, his research team is looking into the use of starch that's a byproduct of pulse processing. The project is funded by the Government of Saskatchewan's Strategic Research Initiative.

"There are processes set up to extract protein out of the pulse, and after the protein is extracted, the starch is left. We have to find some application for that starch," he said.

Acharya's goal is to see if the starch can be used in developing packaging foam materials. Much of the materials for packaging used now come from petroleum sources; think of the materials used in shipping to keep items safe, or the trays that meat and vegetables are packaged on in the grocery store. He wants to understand the process of creating those materials from starch and see how it can be developed in a more scalable way.

Another project he's involved in is looking at using the byproducts from the processing of wheat straw to produce cellulose pulp for the pulp and paper industry. He thinks those byproducts may have the possibility of being used to make biochemicals and bioplastics.

Globally, there is a trend of moving away from single-use plastics, and Acharya thinks there are many real-world applications for his research.

"In Europe, they already have different policies to ban single-use plastics. It is very likely that Canada and other parts of the world will also be slowly adopting those policies," he said. "When that happens, we will need an alternative product from biobased sources to replace those single-use plastics. … With that momentum, the process and technology and the products we'll be developing in the research will be picked up by the industries."

Dr. Bishnu Acharya (PhD)

Photography by Brett Makulowich

Making a difference in the world

Acharya said growing up in Nepal gave him a unique view of the world and influenced his career path.

"Coming from Nepal, small developing countries do not have much source of petroleum or other fossil fuels and have to import most of the fossil fuels from neighbouring countries. In smaller countries like Nepal, we have to be self-dependent."

Agriculture is practiced around the world, and he was interested in the idea of using the byproducts of agriculture to produce energy and other valuable materials, allowing smaller countries to be more independent.

Near the end of his bachelor's degree at the Institute of Engineering in Nepal, he took a course on bioenergy and hydropower, sparking an interest in renewable energy. He liked the idea of making a difference in the world in the face of climate change.

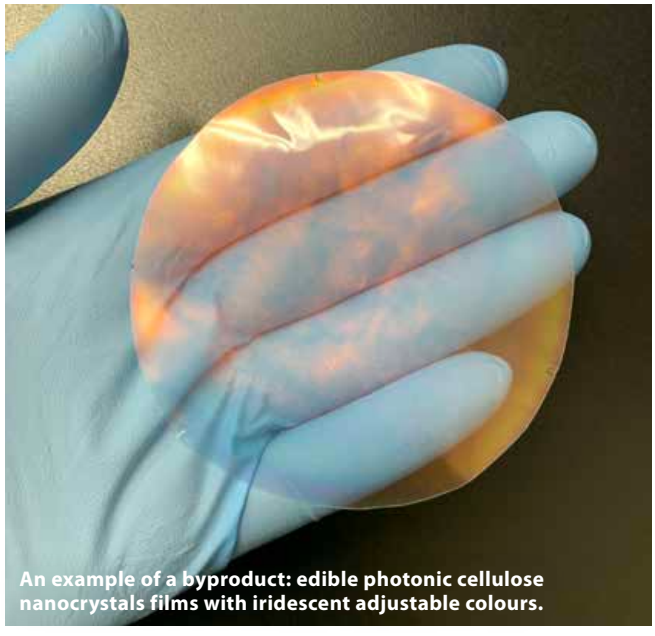
He attended the Asian Institute of Technology in Thailand for his master's in energy technology and worked on renewable hydrogen from biomass, focusing on fuel cells for power application. He then did his PhD at Dalhousie University, continuing in that line of research, developing the technology for hydrogen production from biomass.

Following his PhD, he worked for the Halifax-based company Greenfield Research Incorporated, giving him a chance to see his research from the industry perspective.

"I was able to initiate a number of projects funded through other industries," he said. "It gave me an opportunity to learn how things are done at the industry and community level."

Acharya loves connecting with industry and problem solving, but he said what he loves most about his work is engaging with students and seeing their development.

"Talking to students, providing an equitable and inclusive learning environment—and trying to help them grow in their career—I think is very fascinating about this work. Seeing your students carrying your vision forward and implementing them provides great satisfaction."



An example of a byproduct: edible photonic cellulose nanocrystals films with iridescent adjustable colours.

Photography by Amin Babaeighazvini

He said the focus in the world has been shifting towards bio-based materials and chemicals that have less of an impact on the environment, and much of the research happening in his field will be realized in the next 10-15 years.

"I strongly feel the students today who are being trained in this area will be the champions who will be leading this change," Acharya said.

Graduate student making contributions to improve the poultry industry

Graduate student, Sameeha Jhetam

Photography by Jo Ann Chew

✎ NYKOLE KING

Sameeha Jhetam's love of animals is what attracted her to animal welfare research. She never imagined that it would lead to a PhD program or being a member on the national youth council for agriculture.

Jhetam, originally from Johannesburg, South Africa, is a graduate student in the Department of Animal and Poultry Science in the College of Agriculture and Bioresources. She is passionate about using her research to help producers.

"The agriculture industry is continually trying to improve animal welfare in livestock and poultry production, and so I think that using research and science to improve welfare and wellbeing of birds and animals is really important," said Jhetam.

"We have to be able to feed the world, and by feeding the world, we also want animals to live good lives while doing so."

Although Jhetam doesn't come from an agricultural background, she gravitated towards animal bioscience during her undergraduate program. After completing an honours thesis under the supervision of Dr. Karen Schwean-Lardner (PhD), an associate professor specializing in poultry management and production, she knew she wanted to stay in the college for graduate studies.

"It wasn't what I expected to go into, and when I started learning more about research and research opportunities, it sparked my interest. I just really love the research aspect of agriculture, and so I knew that that's where I wanted to stay," she said.

Jhetam began her master's program in poultry welfare with Schwean-Lardner as her supervisor in 2018. Her research project looked at the impact of stocking density on the performance, health and welfare of turkey hens.

She completed two trials, both of which were 11 weeks in duration, where she monitored 3,550 turkey hens. Every day, she would check on the progress of the turkey hens at the University of Saskatchewan's (USask) Poultry Centre and record data of both the physical condition of the birds as well as the behavioural conditions.

"Focusing on management practices and how that affects poultry welfare, using day-to-day management practices that producers use, and trying to improve (upon those practices) to improve animal welfare – it's a very big part of the poultry industry and that's what really attracted me to the field," she said.

There are 522 turkey producers across Canada, making it smaller than other poultry industries, such as broiler chickens. Turkey welfare and management is less researched, but Jhetam sees it as more reason to contribute research for underserved turkey producers.

"Turkey hen research and how stocking density affects turkey hens hasn't been studied in 22 years, so this project is pretty novel in terms of time. We really hope that from this research industry can make stocking density recommendations," said Jhetam, who successfully defended her master's thesis in July 2021.

Advocating for agriculture

Jhetam is passionate about improving the livestock industry and helping poultry producers. When the Agriculture and Agri-Food Canada put out a call for applications to join the first Canadian Agricultural Youth Council (CAYC), she jumped at the chance.

From over 800 applications, Jhetam was selected to be one of 25 members to sit on council for an 18-month term starting in January 2021.

Jhetam's council responsibilities include youth outreach, especially to youth in urban centres, to make them more aware of topics in agriculture and to consider a career in agriculture. She manages the CAYC social media channels, and is working to unite agriculture with education by starting in classrooms.

"We see a big gap in what youth understand about agriculture careers and some barriers to entry, so I think if we start from the elementary education level, we might be able to get more people into the industry," she said.

Jhetam hopes to see more youth from various backgrounds entering the sector because they will bring new perspectives and knowledge and help contribute to the growing need to feed the world's population.

Not only did Jhetam feel it was important to represent the poultry industry on council, but she also wanted to contribute her perspective as a Muslim, immigrant woman of colour in agriculture.

"I think that by me following my passions and aiming to work in the poultry industry and by being that small representation, it might encourage more diversity in the sector."

Industry engagement

In fall 2021, Jhetam will begin her PhD program and a new research project on the wellbeing of leghorn chickens during the hatchery process. What drew her to this project is that she will have first-hand experience about hatchery management through an internship during her research.

"Mitacs funding allows us to partner with industry, and in this case, we were very fortunate to partner with multiple poultry industry groups across Canada! Not only does this program allow us to match funding, but a requirement is that the student gets to work with one or more of the industry partners," said Schwean-Lardner.

Mitacs is a national, not-for-profit organization that designs and delivers research and training programs across Canada.

"Sameeha will be able to work with a commercial leghorn breeding farm and a commercial hatchery as a partial meeting of this requirement. It is so exciting that she will have this ability to learn industry practices!"

Jhetam is undertaking a large project made up of three distinct parts, all of which are novel areas of research. The first part is assessing whether an infrared beak treatment (IRBT) holding device used on newly hatched chicks impacts their stress levels and overall wellness.

The second part of the project focuses on the space allotments in transport boxes, and whether there is an effect on the nutrient absorption or behaviour of leghorn chickens. The third part involves assessing whether during long-term transport, if early, interrupted or no feeding at all will impact the health and welfare of the chicks.

Photography by Jen Banks

Jhetam is looking forward to contributing to a novel area of poultry research, and she's thankful that the College of Agriculture and Bioresources provided her opportunities to partner with industry in her research.

In the span of six years at the college, Jhetam has become an outstanding contributor to livestock research, industry, and policy. Her passion for helping animals led her to a career she loves, and for any youth considering going into the field, she encourages them to let that passion lead them.

"Pursue what you're passionate about," said Jhetam. "A career in animal science and livestock is very fulfilling. It feels like you're making a difference in the lives of many animals. Always work hard and follow what you're passionate about."

The art, science and conservation of prescribed fires

The Canadian Prairies Prescribed Fire Exchange enhances partnerships and training to support ecosystem management across the prairie provinces.

✎ JANE CAULFIELD

Spring 2021 prescribed fire at USask's Kernen Prairie

Photography by Angie Li

Promoting fire as a resource management tool may feel counterintuitive, especially when wildfires are ripping through Canadian forests at unprecedented rates. But properly used fire is an important instrument for conservation, traditional practice, and public safety.

"We're looking to manage native habitats and natural ecosystems as closely as we can to the way they evolved in the previous 10,000 years. One of the key drivers of that evolution is fire," said Matthew Braun, manager of conservation science and planning at the Nature Conservancy of Canada, and alumnus of the College of Agriculture and Bioresources. "We can carefully mimic the way fire happened in the past, much like we use livestock grazing to mimic the herds of bison that used to graze on the prairies."

Defined as a controlled burn conducted within very strict parameters, including weather conditions and ground moisture, a prescribed fire is often very slow and involves a crew of people working together to keep things contained within a designated area. A wildfire is almost the exact opposite – they are uncontrolled, fast-moving, and uncontained.

"Fire helps with renewal processes, can help manage invasive species, can stimulate regrowth, and can help with nutrient recycling."

RENNY GRILZ

"You can use fire to achieve specific management goals," said Renny Grilz, resource management officer at the Meewasin Valley Authority, and graduate of the college. "Fire helps with renewal processes, can help manage invasive species, can stimulate regrowth, and can help with nutrient recycling."

The list of ecological benefits of fire is long; it can even help stop the spread of wildfire by corralling an uncontrolled fire into a controlled state. But it can also be immensely destructive if not managed properly. Something the Canadian Prairies Prescribed Fire Exchange (CPPFE) is hopeful it can help its member groups avoid through training and knowledge translation.

"We really want to raise awareness to the fact that fire can be seen as a tool. We are working to contribute to both the science and the training," said Dr. Eric Lamb (PhD), associate professor in the Department of Plant Sciences. "We're working to professionalize our own practices and develop the appropriate training protocols to help people overcome barriers to using prescribed fires in their own resource management approaches."

Sharing knowledge to harness the art of prescribed fire

Indigenous people have been using fire to manage their lands and sharing their knowledge for generations, meaning that various associations and organizations can use the same techniques to revitalize grasslands across the province. But only recently have these groups come together to form the Canadian Prairies Prescribed Fire Exchange (CPPFE), to develop and implement essential training standards, raise awareness, and support each other with planning and execution.

"There's been people doing this kind of work in Saskatchewan for years. What this allows us to do is no longer work off the sides of our desks and improve efficiency," said Braun. "We now have actual dedicated resources and a dedicated full-time position to helping us all work together and actually get more people trained, get more people comfortable with prescribed fire, and get more prescribed fire on the landscape safely."

The CPPFE is the result of several

Prairie crocus (*Pulsatilla nuttalliana*) singed by the prescribed fire.

Rough fescue (*Festuca hallii*) resprouting after the prescribed fire.

Photography by Eric Lamb

provincial and national member groups, such as the University of Saskatchewan (USask), Meewasin Valley Authority, Parks Canada, Association of Manitoba Community Pastures, Saskatchewan Parks Service, and the Canadian Wildlife Service, combining efforts and knowledge to achieve shared goals. Together, they have developed training standards for anyone interested in prescribed fires. The group has secured a five-year grant from the Weston Family Foundation through The Weston Family Prairie Grasslands Initiative to create the CPPFE and engage land managers and owners in the safe use of fire as a prairie grassland management tool.

"We're really trying to find as many different ways as we can to connect with the people who could be impacted by prescribed fire or could use it as a tool in the future," said Braun. "You don't need a master's degree in range management to do a prescribed fire. But you do need knowledge of equipment, how fire works, an understanding of fuel and changes in weather. That's the knowledge we want to help people learn."

As a collective, the CPPFE will support its member groups in several ways, including the development of an equipment cache to ensure that everyone has easy access to the right tools needed for a successful burn.

"When I first started doing prescribed fires in the early 90s, you showed up in a flannel shirt and jeans, and you went to work," said Grilz. "And now you need protective equipment, fire-resistant coveralls, radios, water packs, and all sorts of equipment. So, this helps smaller groups who want to go out and try fire from having to invest heavily on that aspect of it."

The CPPFE is starting to work with fire departments, offering training on prescribed fires in urban contexts, helping firefighters understand how to use fire to protect against possible future wildfires and the damage and loss they create.

"It's an opportunity for these groups to understand how to prevent fire with fire and also to fight fire with fire," said Grilz.

Understanding the science of burning

As both Braun and Grilz point out, fire allows their organizations to control invasive species, encourage seed germination, and even limit the spread of wildfire. But understanding how, when, and where to use fire appropriately comes from the knowledge gained through years of research. Lamb has been looking into the ecological science behind fire for more than a decade. Most recently, he has focused his curiosity on an aspen stand in USask's Kernen Prairie, which is one of the largest remaining patches of fescue prairie in the province.

"We did a spring burn where we burned about two hectares of land, which included an aspen stand," said Lamb. "This will allow us to research how fire impacts the drought-stressed aspen and how the insect and plant life rejuvenate."

Lamb has spent several years conducting research projects using prescribed fire on various grassland environments across Saskatchewan.

"We get to ask, and answer, the subtle questions about how fire can benefit the land," said Lamb. "Figuring out the timing of a burn to help manage invasive species means we can better manage the natural biodiversity that occurs within these landscapes."

Because member groups represent diverse ecological interests and management goals, the opportunities for new research and to ask new questions continue to grow.

"The CPPFE provides opportunities to train students and give them the experience needed to conduct research on prescribed fire," said Lamb. "In doing so, the CPPFE can continue to grow and be a needed support to conservation for years to come."

Thank you
to our donors

July 1, 2020 – June 30, 2021

$100K–$1M

A & W Food Services of Canada Ltd.
BASF Canada Inc
Saskatchewan Cattlemen's Association
Saskatchewan Flax
Development Commission
Saskatchewan Wheat
Development Commission
Western Grains Research Foundation

$10K–$100K

Alberta Wheat Commission (AWC)
Bayer CropScience Inc.
Canadian Canola Growers Association
Cargill Limited
CropLife Canada
Delage Farms Ltd.
Keith Downey
Marion Y. MacLean *
Mark B. Humbert
O & T Farms
Saskatchewan Canola
Development Commission
Saskatchewan Pulse Growers
TD Canada Trust

$1K–$10K

Aaron G. Storos
Agriculture Students' Association
Albert C. Running
Andrew A. Olkowski
Andrew G. Mickleborough
Canadian Prairie Lily Society
Cecil G. Werner
Charlene Racz
Chicken Farmers of Saskatchewan
David A. Lundquist
Edward L. Gray
Edwin W. Everitt
Eric S. Beamish
Federated Co-operatives Limited
Frances R. Clarke
George G. Pearson
Glen L. Campbell
Howard Lindberg Memorial Award
Jason T. Leader
Kent R. Mickleborough
Lorne J. Fisher
Marion I. Goertz
Mary L. Sonntag
Palliser Environmental Consulting
Patrick M. Beaujot
Raymond A. Ryland
Robert B. McKercher
Saskatchewan Alfalfa Seed Producers
Development Commission
Saskatchewan Institute of Agrologists
Saskatchewan Seed Growers Association
Saskatchewan Stock Growers Association
Saskatoon Community Foundation
Saskatoon Horticultural Society
SaskMilk
SGS Canada
Sharie Babonich
Shawn R. Buhr
Todd A. Treslan
Walker Wood Foundation
William E. Turner
Women in Ag

* deceased

$100–$1K

Alma J. Copeland
Alvin G. Rice
Anna L. Spinney
Armin J. Krahn
Arthur E. Delahey
Bachitter Singh
Baine A. Fritzler
Barry L. Swanson
Battlefords and District Community Foundation Inc.
Bela Mathur-Dunleavy
Benevity, Inc
Bernard A. Kotelko
Brenda F. Enright
Brendan L. Ostafie
Brian G. Perkins
Bruce A. Elke
Bryan L. Harvey
Bryce S. Pashovitz
Cameron J. Seidle
Carol A. Straub
Carol D. Rodgers
Carolyn M. Brooks
Cecil B. Haight *
Charles H. Hopkins
Charmaine M. Ross
Colin W. Steen
Craig M. Richter
Dalton J. Ewert
Daniel M. Beveridge
Darlene D. Collins
David A. Blau
David D. Maenz
David G. Gallaway
David J. Thornton
David N. Sharpe
David S. Beckie
David T. Gehl
Dean C. Dyck
Deborah L. Haupstein
Delwyn J. Jansen
Derald W. Ahner
Donald G. Connick
Donald G. Hepburn
Donald L. Hamilton
Donald W. Geddes
George A. Toews
George Fedak
Gerald M. Luciuk
Geza J. Racz
Gordon W. Plaxton
Grant A. Hale
Grattan J. O'Grady
Greater Saskatoon Chamber of Commerce
Hadley R. Kutcher
Harold E. Chapman
Harvey C. Goehring
Heather N. Racz
Helen D. Armstrong
Henrietta B. Goplen
Henry J. Zilm
Holly A. Knott
Hugh M. Hopkins
Ian D. Bowie
Ignace N. Minja
Illary Koturbash
James A. Vancha
James Calanchie
James E. Stempien
Janet A. Racz
Janice R. Mindiuk
Jessie Carlson
Joan F. MacKenzie
Jocelyn I. Kish
John A. Humbert
John R. Lane
John W. Babcock
Joseph H. McComb
Keith R. Fournier
Kelleen L. Wiseman
Kenneth A. Bassendowski
Kenneth N. Allport
Kenneth R. Allan
Kenneth S. Little
Kesslering Forsythe Family Fund
L Ruth Schroeder
Larry A. Carnegie
Larry A. Nelson
Larry D. Malinowski
Larry N. Heavin
Leonard D. Scott
Leonard W. Fisher
Lloyd J. Fink
Longview Acres Smith Bros. Farms
Lorna G. Bilokury
Lorraine A. Nadeau
Louise G. Greenberg
Marcel J. Dubois
Marilyn M. Gould
Mark N. Zenuk
Mathur A. Neil
Milton K. Harradence
Murray E. Smith
Neal W. Holt
Norine E. Nathanson
Norman A. Sparrow
Peter D. McLaren
Ralph M. Howes
Ranald A. Moar
Randall B. Kurulak
Richard J. Day
Richard M. Cherepuschak
Robert A. Dodds
Robert B. Neufeld
Robert D. Laing
Robert E. Little
Robert F. Mitchell
Robert G. Anderson
Robert G. Ostafie
Robert J. Baker
Robert L. Mason
Rodney Kent
Ronald L. Morningstar
Ronald R. McKinnon
Ross G. Wilson
Rymel Investments Inc
Sandra J. Watson
Sanjiv Mathur
Saskatchewan Agriculture Graduates Association
Seth E. Adams
Sheena R. Rivett
Sherri J. Grant
Stuart A. Marshall
T.J. Consulting Ltd.
Terrance J. Oleksyn
Timothy M. Berscheid
Trevis O. McConaghy
Verna K. Ward
Vickie L. Bajtelsmit
Vivian R. Noy
W. Keith Head
Warren D. Johnson
Wayne M. Cochran
Wayne W. Holzapfel
Wendell A. Rice
William J. Copeland
William N. Hurd
William R. Pistawka
William R. Schroeder
Yvon A. Martel

UP TO $100

Alan R. Hammond
Albertus W. de Gooijer
Allison A. Lacelle
Bev G. Rapinda
Beverly J. Schutzman
Brenda L. Baker
Brian M. Ellis
Christina J. Evans
Christina L. Lambert
Claire L. Dussault
David M. Aronoff
David P. Bunte
Donald F. Acton
Donald P. Wilkins
Elizabeth J. Theis
Ellwood H. Fleming
Elwin G. Smith
Frederick G. Walker
George A. Ledingham
Gwendolyn N. Papov
Harold J. Popoff
Herbert S. Brinkhurst
Jacob L. Hamm
James A. McGillivray
Johanna M. Wu
John A. Raine
Joy N. Crawford
Kathleen Little
Keith E. Akins
Kevin Emmerson
Lawrence W. Gelleta
Leanne M. White
Lyle M. Ballard
Marc G. Hannotte
Margaret Phillips
Marie I. Hammer
Mary M. Eaton
Michael J. Volk
Mortoza Tarafder
Orrin M. Clayton
Orville G. Myrvang
Orville L. Thompson
Owen J. Chandler
Patricia M. Proudlove
Pauline Eng
Peter A. Ignatiuk
Rhonda L. Farley
Richard D. Kabzems
Robert A. Jones
Robert M. Gordon
Roberta E. Hildebrandt
Terese L. Bedard
Vanessa M. Headford
Violet Petriw
Warren G. Pridham
Wendy M. Wiggins

GIFTS OF EQUIPMENT

Morris Industries Ltd.
Contribution: Contour Drill and Cart

New Holland Agriculture and Robertson Implements
Contribution: Three tractors

WAYS TO GIVE

- **Online**
- **Phone**
- **Mail**
- **Pre-authorized debit**
- **Securities and mutual funds traded on the major Canadian and US stock exchanges**
- **Gifts-in-kind**
- **Matching gifts**
- **Charitable estate gift**

For more information on any of the giving options, contact:

Hamish Tulloch
Director of Development
(306) 966-8893
hamish.tulloch@usask.ca

We also acknowledge and celebrate those who have established planned gifts for the College of Agriculture and Bioresources. These arrangements help shape and secure our college's future.

Ensuring the longevity of our critical research and extension activity

New funding model for professorships brings the Beef Industry Integrated Forage Management and Utilization Chair to the University of Saskatchewan (USask).

✎ NIYA HURLEY WITH FILES FROM AGBIO NEWS

This summer, the College of Agriculture and Bioresources announced a new Beef Industry Integrated Forage Management and Utilization (IFMU) Chair — a continuing status faculty position — to address a gap in forage research.

"Limited investment in research and development in previous years has held back advances in forage management and utilization compared to annual cropping systems," said Dr. Angela Bedard-Haughn (PhD), dean of the College of Agriculture and Bioresources. "We are about to change all that with this new collaboration."

The Beef Industry IFMU Chair position is funded through a collective of producer groups, the federal and provincial governments, and others with an interest in realizing the true potential of forage crops, which will require a long-term commitment.

The Beef Cattle Research Council (BCRC) contributed $2.5 million to this initiative, affirming the industry is increasingly seeing forages as a high-value feed source.

"The Chair will help to address concerns by producers searching for expanded forage management information," said Matt Bowman, BCRC chair and a producer from Thornloe, Ont. "We need the science to better manage complex forage systems, implement effective utilization strategies, and understand the associated environmental benefits."

"Forage production and utilization are the foundation of beef cattle productivity and competitiveness," added Arnold Balicki, chair of the Saskatchewan Cattlemen's Association (SCA) which committed to investing $1 million to the chair. "After years of advocacy, it is gratifying to see this position created via partnership between producers, government, USask and the Global Institute for Food Security (GIFS)."

"This collaboration is an excellent example of our college strategy in action," explained Bedard-Haughn. "We are adapting our thinking, our research and our teaching to a new reality defined by complex industry needs and a changing environment. Most funding models for research chairs provide support for five to seven years but when we are looking at researching these complex management systems, that isn't long enough to deliver the results and transfer knowledge."

Sustainability

The long-term, sustainable funding from a diverse donor group eases the financial burden on individual contributors and enables multiple players with common interests to make significant impact with a smaller, multi-year investment. In this case, in addition to BCRC and SCA, the governments of Canada and Saskatchewan are contributing $750,000 through the Canadian Agricultural Partnership (part of a five-year, $3-billion investment in Canada's agri-food and agri-products sectors), and GIFS at USask committed $320,000. The funders' contributions will be grown with the university's other long-term investments. The investment earnings will be used to fund the chair position for a full faculty member's career term (anticipated to be 30+ years), catalyzing and delivering the research and knowledge sharing in forage management that the industry needs.

Collaboration

"This research chair will work with partners from across the province to develop practical tools for producers," said David Marit, Saskatchewan minister of agriculture. "This investment will help grow the livestock sector and bring us closer to achieving the goals outlined in Saskatchewan's Plan for Growth, including increasing livestock cash receipts to $3 billion."

Among the Chair's key roles will be to ensure USask is the leading authority on forage research and use in the beef industry, connect expertise in the field, and grow funding support for research. Extension activity — e.g. outreach events and industry field days — will ensure the insight gained from research reaches the producers who need it most.

A broadly cooperative venture, the Beef Industry IFMU Chair also engaged the USask-based Global Institute for Food Security.

"This is a great opportunity for GIFS and the Plant Phenotyping and Imaging Research Centre program," said GIFS Chief Executive Officer Steven Webb. "This collaboration will help us advance the agriculture and food sectors in a manner that is economically, environmentally and socially sustainable."

The international search began this summer and USask anticipates filling the position by spring 2022. "This professorship sets a new standard for future endeavors to fund research, teaching and extension," said Bedard-Haughn. "This is how we become the university the world needs."

"This collaboration is an excellent example of our college strategy in action."

DR. ANGELA BEDARD-HAUGHN (PHD)

The Saskatchewan Agriculture Graduates Association (SAGA) proudly represents the interests and accomplishments of graduates from the college and school. This past year was another year of notable accomplishments and contributions.

SAGA
SASKATCHEWAN AGRICULTURAL GRADUATES' ASSOCIATION INC.

@saskaggrads
saskaggrads.com

Honorary life members for 2021

John Hickie (56 S & '59 C) was born on the family homestead near Loon Lake, SK in 1935. The family moved to Waldron, SK, near Melville, where he completed elementary and high school. John initially majored in Crop Science but switched to Farm Management, graduating with great distinction. He obtained his MSc at the University of Guelph in Ag Economics.

He returned to Saskatchewan to work for the Ministry of Agriculture, spending 27 years as a Farm Management Specialist. In this role John influenced hundreds of farmers over the years with his practical approach to the business of farming. He too was a farmer, on 1700 acres near his childhood home. Upon retirement from Sask Ag and Food, he farmed his land full time.

John wished to give back to the community and to the institutions which influenced his life. In this spirit, he made several significant gifts to the University of Saskatchewan (USask), including the establishment of the Major Alfred Frank Mantle Memorial Scholarship in honour of the province's first deputy minister of agriculture. He had managed a similar award during his employment with the ministry that ultimately ran out of funds, and the experience solidified John's belief that Major Mantle's contributions to the agriculture sector should never be forgotten.

John was profiled in the 2019 issue of Agknowledge after donating a section of cropland (known as Perseverance Farm) to USask. The earnings derived from this gift provide enduring support for students at the college by funding scholarships while also ensuring the Major Mantle award remains viable in perpetuity. Through his gift of land to USask, countless students will be given opportunities for an education that helps them to establish rewarding careers in the agriculture sector.

David Christensen ('58 C) Dr. David Christensen (PhD) has spent most of his career in the Department of Animal and Poultry Science at USask, starting in 1965 as Assistant Professor and actively continuing today as Distinguished Professor Emeritus. Dave's career has demonstrated excellence in teaching, research and administration and he is particularly known for his expertise in dairy nutrition. He served on the SaskMilk Control Board and as technical advisor to Alberta Milk. His research has included mineral, forage and other feed evaluation. This was done in collaboration with 70 graduate students as well as other researchers.

Dave has been recognized nationally and internationally for his work and has received numerous awards including being named a Member of the Order of Canada (2002), induction into the Saskatchewan Agriculture Hall of Fame (2011) and being awarded the Queen's Diamond Jubilee Medal. But most importantly, Dave has been recognized and respected by the thousands of students that passed through his classroom doors for 50 plus years. He remains active with consulting, assisting graduate student projects and a few guest lectures.

2021 highlights

Bryan Harvey ('60 C) University of Saskatchewan Honorary Doctor of Science

World-renowned barley breeder, Dr. Bryan Harvey (PhD) spent four decades contributing to the field of plant science and to the Canadian agriculture economy through his work with the Crop Development Centre at USask. Among his multitude of awards and recognition, Bryan became a SAGA Honourary Lifetime Member in 2015.

SAGA Undergraduate Award Scholarships

Our second year of funding two scholarships valued at $3,000 each were awarded at the college's very first virtual Bean Feed awards celebration last fall. The recipients were Baylie Yasieniuk (second and final year of an Agribusiness Diploma) and Jourdyn Sammons (fourth year BSA majoring in Animal Science with a minor in Range Resources).

Details on how to contribute to the scholarship fund can be found at **saskaggrads.com**.

The Pioneering Women of the College of AgBio

Margaret Georgina Landes, 1936 BSA, 1937 MSc was the first woman to graduate from the college. **Irene Ahner '65 C**, has been researching and compiling the histories of the first female AgBio grads, in both the diploma and degree programs. Her results so far can be read in the Dec. 2020 and June 2021 issues of *The SAGA* (saskaggrads.com – Newsletters).

Irene, who ranches NE of Maple Creek, is asking all grads with possible leads and/or pertinent information of the women listed on p.8 of the June 2021 newsletter, to contact her. She can be reached at ireneahner@gmail.com, (306) 662-3463 or Box 939, Maple Creek, SK, S0N 1N0.

87th Annual SAGA Reunion Weekend

SAGA has tentative plans to hold our reunion activities in-person the weekend of January 7-9, 2022. The Executive is following provincial health regulations and the most up to date information on plans for the reunion can be found at **saskaggrads.com**. We appreciate the patience of our alumni as these plans are subject to change due to the pandemic. The tentative plan is as follows: the Friday night social at the AgBio Atrium, Saturday hockey tournament in Waldheim and the banquet at TCU Place. The next reunion will include all classes from the postponed 2021 event.

We are pleased to be in discussions with the Chairpersons of *all* 44 of our honour-year classes (from 1941 & 1942 all the way to 2016 & 2017) to accommodate these grads at the banquet on Jan. 8, 2022, plus everyone from before, in-between, and after those years who wishes to attend.

For more information and updates, follow us on facebook, twitter and our website at **saskaggrads.com.**

UNIVERSITY OF SASKATCHEWAN
College of Agriculture and Bioresources
AGBIO.USASK.CA

ROBERTSON IMPLEMENTS

RobertsonImplements.com

Proud Supporter of the University of Saskatchewan and the College of Agriculture and Bioresources

Connect with us online!

agbio.usask.ca


@agbiousask

BE WHAT THE WORLD NEEDS

Return undeliverable Canadian addresses to:

College of Agriculture and Bioresources
University of Saskatchewan
51 Campus Drive, Saskatoon, SK S7N 5A8

Publications Mail Agreement Number 41255028