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CONTENTS

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Dean's message	2
2024-25 year in review	3
The value in managing risk in the cattle industry	4
USask PhD Student Rebecca Zanello is looking to better understand how producers manage business risk and make rangeland management decisions.	
Taking a love of farming to market	6
When USask alumnus Colin Rosengren (BSA'97) co-founded Three Farmers, he brought a love of sustainable farming to the business.	
Cultivating global connections	8
Dr. Karen Tanino (PhD) is growing more than just resilient plants—she's cultivating global partnerships that are transforming agricultural research and education.	
Supporting the AgBio advantage through a flexible donation	10
Gift from Bob Mason (BSA'65) and Cora Greer (BA'70) will help the College of Agriculture and Bioresources grow.	
Innovation in non-ruminant nutrition for a healthier future	13
USask's Dr. Deborah Adewole (PhD) looks to make non-ruminant animal production more sustainable through cost-effective and nutritional alternative feed ingredients.	
Shaping the next generation of lentils and faba beans	16
Dr. Ana Vargas (PhD) is bringing fresh energy and perspectives to the development of some of Saskatchewan's most important pulse crops.	
Wilderness wanderer to climate warrior	19
Dr. Bryan Mood's (PhD) passion for the Earth has led him from Nova Scotia's forests to teaching environmental science at USask.	
Donor recognition	22
Science, sustainability, and storytelling	26
Meet USask alumna Jenna Sarich (BSc(AnBiosc)'19, MSc'23), an up-and-coming voice in Canadian beef research.	
Changing the future of food	28
USask's Department of Food and Bioproduct Sciences taps into the potential of fermentation, protein extraction, and ingredient development.	
"Be prepared for big things" from the Nutrien Centre for Sustainable and Digital Agriculture	31
New collaborative hub is now being created in USask's College of Agriculture and Bioresources.	
Building better lentil varieties at USask	34
USask PhD student Alex Silvestrini explores ways to build more resilient lentil varieties.	
SAGA highlights	36



◀ USask undergraduate students (Shayla Woychysyn (back-left), Bowen Webb (backcentre), and Peydan Zeman (front)) work with teaching assistant Hanna Weffen (back-right) to classify an organic soil near Candle Lake, Sask. as part of the SLSC 460: Forest Soils field course.

Photography by Bryan Mood

DEAN'S MESSAGE



Dr. Angela Bedard-Haughn (PhD)
Photography by David Stobbe

Each year, when I sit down to write my “dean’s message” for *Agknowledge*, it is a time of reflection.

This year, I’m also thinking back on my first five-year term as dean (2020-2025) and about how far we’ve come, both literally and figuratively, from my first year as a “COVID dean” (2020-2021) ensconced in my home office, to the remarkable achievements of recent years. We remain deeply rooted in Saskatchewan and are so proud of the local impact of students, faculty, staff and alumni.

In this issue, you can check out the work of Rebecca Zanello, who received a prestigious national scholarship to support her PhD research on business risk management programs in the cow-calf sector. You can learn more about alumnus Colin Rosengren (BSA’97) and Three Farmers, and how Bob Mason (BSA’65) and Cora Greer (BA’70) were inspired to support the college.

Locally, we also strive to respond to student and community needs. For example, our newly launched Certificate in Introductory Agriculture can be done online or in-person. It was designed for non-ag professionals needing a better understanding of agriculture in the Canadian Prairies, new and current students across disciplines, educators who want to deliver science-based agriculture programs in primary and secondary schools, and individuals seeking entry level, non-professional agriculture employment. We want to create as many opportunities as possible for our community to learn more about ag!

Our impact extends beyond the local, though! Globally, we are ensuring that the world understands the strength of the College of Agriculture and Bioresources (AgBio) and indeed the strength of our sector; there’s no better ambassadors than our students, faculty and alumni! Some examples you’ll see in this issue include Alex Silvestrini, a PhD student studying plant genetics who took advantage of the McKercher travel award to do lentil research in the Czech Republic; Dr. Karen Tanino (PhD) recently received the J.W. George Ivany Internationalization Award for her efforts to facilitate student learning in Japan and to bring Japanese students to USask; and alumna Jenna Sarich (BSc(AnBiosc)’19, MSc’23) has become part of the global community of Nuffield Scholars. In addition, his fall, three of AgBio’s excellent centres were invited to be part of the United Nations’ Food and Agriculture Organization (FAO) Seeds to Food Global Expo in Rome, including the Crop Development Centre, the kihci-okāwīmāw askiy Knowledge Centre, and the new Nutrien Centre for Sustainable and Digital Agriculture.

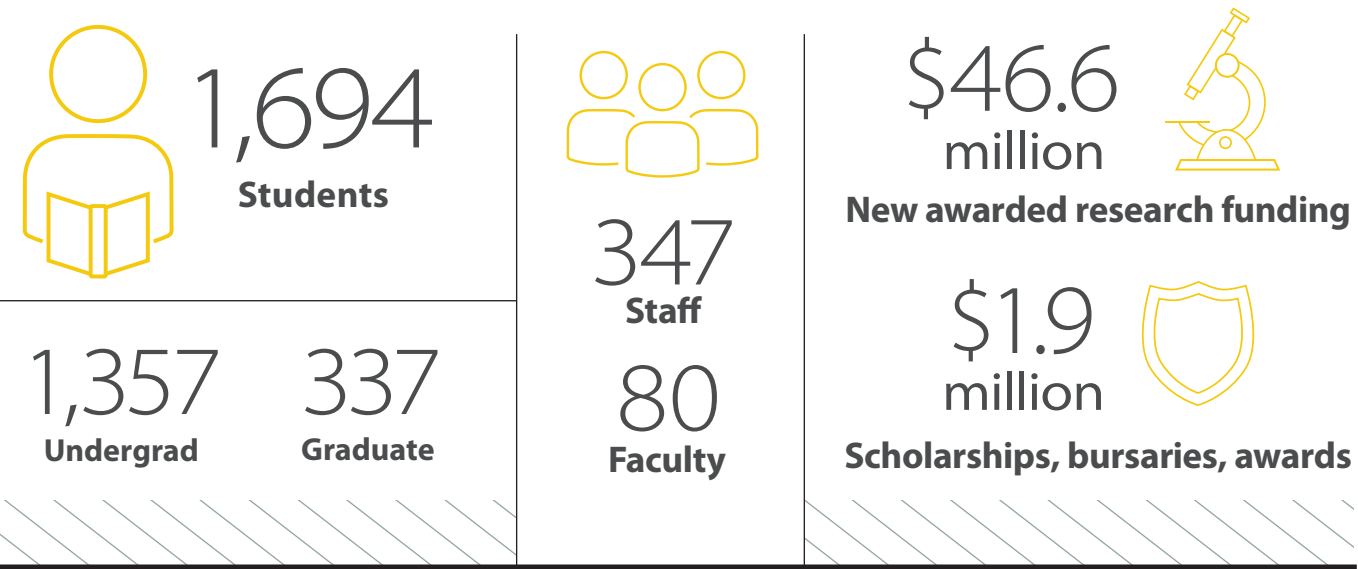
It’s accomplishments like this that strengthen our global reputation, which has also allowed us to attract some exceptional new faculty as part of our recent hiring (14 new faculty in the last 3 years!), and you can learn more about a few of them here, including Dr. Deborah Adewole (PhD), Dr. Bryan Mood (PhD), and Dr. Ana Vargas (PhD).

As I roll into my second term as dean, and the college embarks on strategic planning to identify our key priorities for the coming years, I am encouraged by the continued support of our community—by all of you. From local to global, the College of Agriculture and Bioresources continues to thrive. Thank you for being part of our success!

– Dean Angela Bedard-Haughn

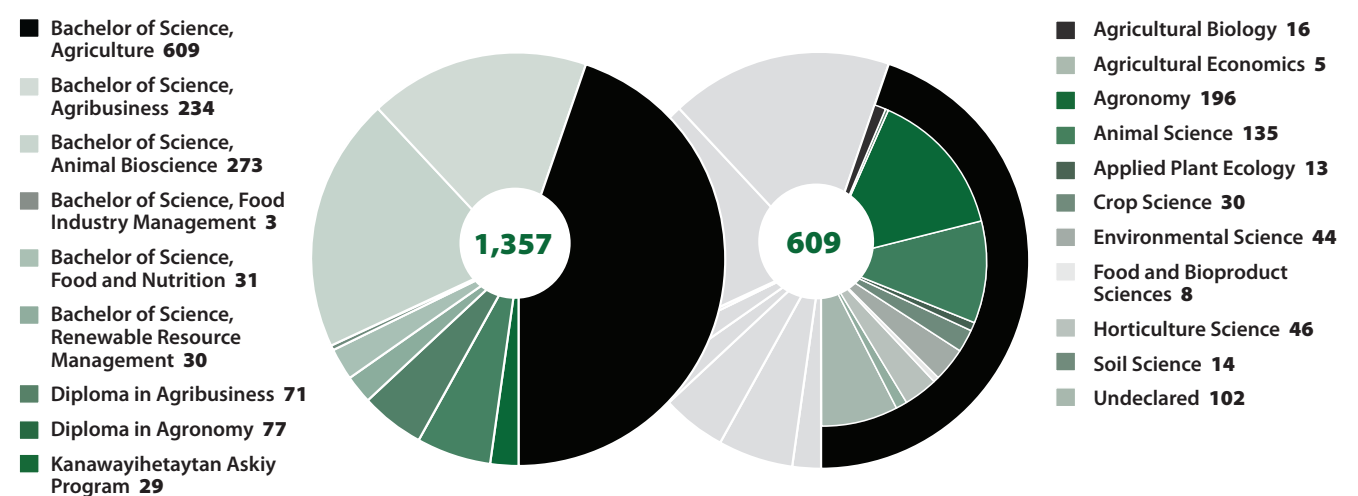
YEAR IN REVIEW 2024-25

Rooted in history since 1912, the College of Agriculture and Bioresources is growing the future. 🌱



Undergraduate students by program

Bachelor of Science, Agriculture students by major



The value in managing risk in the cattle industry

USask PhD Student Rebecca Zanello is looking to better understand how producers manage business risk and make rangeland management decisions.

 JANE CAULFIELD

Rebecca Zanello
Photography by Laura Zanello



Running an agricultural business comes with a lot of uncertainty. Risks such as unexpected disease outbreaks, market volatility, and weather variations can all impact success rates year over year, with devastating outcomes if not mitigated and planned for properly. This is why there are several government business risk management programs available to agricultural enterprises across the country. And while these programs are known to provide a benefit to producers, there are a few unknowns worth looking into.

"In Canada, there's a big gap between business risk management programs for crop producers, such as grain and oilseed farms, and cow-calf producers," said University of Saskatchewan (USask) Agricultural Economics PhD student Rebecca Zanello, who received a national scholarship from the Social Sciences and Humanities Research Council (SSHRC) to support her research.

It's not that the cow-calf producers aren't relying on the programs that are available—many of them operate mixed farms and manage cropland alongside their herds. As a result, the ability to access business-risk-management programs for crop production offers a benefit to the entire enterprise.

"A lot of respondents indicated that having cattle as part of their operation is very important to them, which makes sense. The cattle industry can be very hard work, so you're not necessarily going to do it if you don't think it's important somehow," said Zanello. "But what I would like to figure out is how can we boost the resilience of the cow-calf part of their business?"

It's this line of inquiry that has led Zanello to launch a dissertation that focuses on how cow-calf producers make business decisions and what values, such as community involvement or financial stability, they maintain when thinking about risk and risk management.

Using a survey-based methodological approach, Zanello looked to group responses into one of three categories based on a social identity framework that has been applied to other industries in the past but has not been used in Canadian agriculture before.

"What I've found so far is that cow-calf producers are always thinking about more than one element in their decision making," she said. "More than half of our respondents seem to be motivated by missionary and communitarian values, where farming for cause or impacts on their local community is significant. Profit is also part of it, but it's not always the largest driver."

She says that preliminary results also indicate that cow-calf producers aren't accessing the business-risk-management programs designed for their specific needs, such as livestock price insurance, very often.

"For the producers, the programs may be too complicated, they don't pay out enough, or they are not subsidized because of legislative parameters regarding livestock production," said Zanello. "I'd like to think that this research could help explore policy changes that provide cattle producers with better risk-management options."

Starting from the ground up

Working alongside the Saskatchewan Cattle Association in partnership with Environment and Climate Change Canada, Zanello is also looking at how cow-calf producers make decisions about rangeland and grassland conversion.

In early 2025, Rebecca and her faculty supervisor, Dr. Eric Micheels (PhD) published a literature review outlining previously established insights and links between business-risk-management programs and voluntary conservation of grasslands.

"In the literature review, we found a lot of information about what's happening on grasslands, such as what pieces of land are being converted and where we should target conservation," she said. "But there was less information about why people are actually converting land and what is happening in that decision-making process."

One insight surfacing from her data is that the ability to buy crop insurance on newly converted land is important to producers. This is significant because it highlights that risk reduction is an important part of land use decision-making.

"Cattle producers are good stewards of the land. They are actively maintaining and taking care of grasslands," said Zanello. "A lot of them sit with the choice to break native prairie and really think about what that choice would mean from many perspectives. It's not usually a decision made lightly."

While Zanello works towards finishing her dissertation, she says that she is not sure what her future will hold, but she will continue working in the cattle industry.

"I really enjoy research that has real-world applications. Agricultural economics has a huge potential for impact," she said. "It really comes back to farmers and producer organizations. Hopefully producers and industry groups will read about our work and find value in what we've done." ■

Taking a love of farming to market

When USask alumnus Colin Rosengren (BSA'97) co-founded Three Farmers, he brought a love of sustainable farming to the business.

 **JANE CAULFIELD**

What do camelina oil, roasted fava beans, and chocolate covered chickpeas all have in common? One, they're all consumer products that rely on Prairie pulses as the primary input, and two, they are all made by the Saskatchewan-based company, Three Farmers.

"Three Farmers started in a stereotypical Saskatchewan farmer way. It was literally three farmers sitting in a curling rink in Saskatchewan discussing the low commodity prices, challenges of our farms, and challenges of our community," said co-founder and University of Saskatchewan (USask) College of Agriculture and Bioresources alumnus, Colin Rosengren.

He says the conversation quickly moved towards the other challenges faced by today's farmers.

"As farms grew, two things happened," he said. "There were less people in rural areas to keep communities thriving and there was a disconnect between rural and urban; between the farmer and the consumer. As farmers do, we tried to come up with ways to improve the situation."

The group decided that if they took some of their products direct to the consumer, they could bring value back to their communities and strengthen the link between producer and consumer through nourishing food that relies on sustainable growing practices. But for the team, the philosophy behind the business runs deeper and their focus extends beyond developing a premium product.

"We wanted to bring healthy products to people and communicate with them about how we produced it," said Rosengren. "The practices we use on our farms in Canada to grow crops are among the safest in the world, and our practices are sustainable. Three Farmers practices go beyond sustainable and are striving to rebuild and improve our soil health all the time."

As a business run by real farmers, working alongside other agricultural producers with similar values, it is important for Rosengren and his partners to maintain transparency throughout. As a result, the entire product mix presented by Three Farmers can

be traced from farm to production to package to the shelves in your community market.

"When we started, we learned that we were not understanding the needs and concerns of the consumer very well," said Rosengren. "We realized that we needed good full-time people to manage these steps. People that had the connection to both us farmers and the urban consumers. This is when we brought on Natasha and Elysia Vandenhurk, daughters of one of the three farmers. They were able to build that connection and establish our products in the marketplace."

Stewarding the land comes naturally

Rosengren is a third-generation farmer, with a passion for sustainable agriculture to ensure the viability of the land for years to come. Armed with his Bachelor of Science in Agriculture from USask, he pioneered intercropping methods in 2004 and has since become recognized for his contributions and insights on regenerative agriculture and soil health.

"Canadian agriculture is not perfect; we acknowledge that we can always do better and we are always learning and trying to do things better," he said. "However, with Canadian agriculture, we have always strived to do our best with a multi-generational long-term view, prioritizing the health of the soil and the environment."

He also says that his time at USask continues to prove invaluable and many of the lessons he learned, both in and out of the classroom, are still relevant today.

"[My education] made me confident enough to share ideas with other farmers and have the hard discussion needed to have a successful partnership and start a company like this," said Rosengren. "It also taught me to think critically. So, yes, we likely did enter the business a bit naively about some of the challenges we would run into, but we knew that we didn't know everything when we started and we had the courage to do it anyway. And third, university taught me the value of connections."



Colin Rosengren
Photo submitted

“[My education] made me confident enough to share ideas with other farmers and have the hard discussion needed to have a successful partnership and start a company like this.”

COLIN ROSENGREN

He also says that the people he met while in university have continued to provide much needed support for both him, his farm, and Three Farmers.

“When we started Three Farmers, each of us three had a different skill set and network. Together we could make better decisions and accomplish more,” he said. “University was a great experience, meeting so many people, the great profs I had, and all the other ag students. It really provided a great foundation for a life of continuous learning.” ♥

Cultivating global connections

Dr. Karen Tanino (PhD) is growing more than just resilient plants—she's cultivating global partnerships that are transforming agricultural research and education.

 MICHELLE BOULTON

A career rooted in resilience

Tanino is a professor of abiotic stress physiology in the Department of Plant Sciences in the College of Agriculture and Bioresources at the University of Saskatchewan (USask). Her international collaborations and commitment to creating international opportunities for her students recently earned her the 2025 J. W. George Ivany Internationalization Award for Faculty. It's well-deserved recognition for someone whose career is defined by crossing scientific, geographic and cultural boundaries to improve global agriculture and student learning.

Tanino's research examines how plants can improve their resistance to multiple abiotic stresses, including low and high temperature, drought, salt concentrations in soil, as well as biotic stress, like diseases. With these interests in mind, it's no wonder she was drawn to Saskatchewan even before completing her PhD at Oregon State University.

"To a person who studies low temperature stress, the -40°C winters were oddly appealing," she said, with a laugh.

Her research is focused on trying to find what she calls "the sweet spot," a common mechanism that allows plants to resist multiple abiotic and biotic stresses.

"In the lab, we usually only impose one stress at a time," she explained, "but in the field, plants are exposed to multiple stresses. What we do in the lab often does not translate into the field."

She is working on a project in which her team constructed 12 high tunnels in the horticulture field plots, where she says they have the best of both worlds. They're growing plants under field conditions and controlling the environment by imposing various stresses at critical stages of development.

Tanino works with a range of plants, from fruits, vegetables, and trees to large field crops like wheat and canola.

"The resilience mechanisms that apply to agronomy and large-scale crops can often be applied to horticultural crops," she said. "The difference is that horticulture crops are high value on small acres. I think our horticulture degree students are attracted to that because you don't need multiple millions of dollars to buy equipment and land."

USask is one of the few places in Canada that still offers a horticulture science degree. However, Tanino says students on the Prairies don't always see the full potential of their degree, so she looks for opportunities to show them what horticulture looks like elsewhere.

"We don't necessarily have to do international travel," she said. "I have taken students to Ontario and Western Canada, places where horticulture really means something."

Creating global connections

Beyond her research at USask, Tanino



Dr. Karen Tanino (PhD)

Photo submitted

holds adjunct professorships at Iwate University in Japan and the University of Agricultural Sciences (GKVK) in Bangalore, India, and leads the Northern Food Security Thematic Network for the University of the Arctic. She also maintains ties with Tamil Nadu Agricultural University (TNAU), in India. Her global network is a reflection of her core belief in international collaboration.

Among these many global connections, USask's partnership with Iwate University stands out. Iwate is part of a consortium of four universities called the United Graduate School of Agricultural Sciences (UGAS). In the early 2000s, Iwate reached out to USask, and the two universities signed their first agreement in 2008. Since then, dozens of PhD students and several faculty members from Japan have visited USask.

This led to a number of other agreements, including a dual PhD in plant sciences.



Students in the Kyoto Bamboo Forest in Japan during Dr. Karen Tanino's (PhD) International Study Tour course.

Photo submitted

"That's where students write one thesis and receive two PhD degrees—one from each institution," said Tanino. "We were the first university in the world to have this with Japan."

Travel as a transformative student experience

One of the most impactful aspects of Tanino's teaching is her International Study Tour (AGRC 311.3), where she takes students to countries like the Netherlands and Japan. Far from being a sightseeing trip, the course is academically rigorous and structured to maximize learning.

Before departure, each student researches and writes a draft paper on one of the 20+ sites they'll visit during the two-week trip. These may include places like research stations, farms, and cultural sites. At each location, students take extensive notes, and on the final day, they write a two-hour open book final exam about the sites they've visited.

Students also attend an international conference during the trip, where they are expected to interview four presenters and write reflections on how they could apply what they've learned back in Canada.

"I like to bring students to international conferences," said Tanino. "They come back excited; they can see how their own research could be applied and valuable."

When they return, students complete their term paper, highlighting what they learned that they could not have found in journals and books, and present their paper to junior students. They're

evaluated on their final exam, their term paper, their conference assignment, and their oral presentation.

"It's intense," she said, "but students have told me it's also life changing."

As a third-generation Japanese-Canadian, Tanino especially values showing students modern agricultural practices and the cultural roots that connect her to Japan.

Global connections lead to innovation

In addition to her other international affiliations, Tanino helped to facilitate an exchange program with the Norwegian University of Agricultural Sciences in which more than 30 faculty and graduate students participated, and also developed a one-on-one student exchange program with Haas University in the Netherlands.

She frequently hosts visiting students from around the world (Australia, Colombia, Norway, China, Thailand) in her home.

Tanino co-advises international dual PhD students and promotes collaborative research.

"You look at the top papers in the top journals, they're not single-author and, most often, they're from multiple countries," she said.

She believes that building a more connected world will power discovery, broaden student and faculty perspectives, and train the kind of innovative thinkers the world needs. ♥

Supporting the AgBio advantage through a flexible donation

Gift from Bob Mason (BSA'65) and Cora Greer (BA'70) will help the College of Agriculture and Bioresources grow.

 **COLLEEN MACPHERSON**

Bob Mason and Cora Greer will say they are ordinary people who have lived an ordinary life. What belies that is their extraordinary gift to the College of Agriculture and Bioresources (AgBio), funds that will enhance student experience for years to come.

The decision to make the gift “wasn’t a long discussion,” said Mason, a 1965 graduate of the college. “We ended up with more retirement income than we thought we would.”

After discussions with AgBio Dean Dr. Angela Bedard-Haughn (PhD), the two chose to make their donation in their daughters’ names—Vanessa Lund and Katrina Mason—but without specific conditions on how the funds must be used.

Mason’s original idea was to provide funding for initiatives aimed at reversing the depopulation of rural areas and promoting more diversity in Saskatchewan agriculture and related industries. But after sitting down with the dean over tea and treats and talking about what she sees as the greatest opportunities for the college and the industry over the next few years, Mason and Greer realized there were many ways their support could help, and instead opted for a gift that would allow maximum

flexibility for maximum impact.

“Angela wants to encourage more students to get into the college, so we’ll let them decide how best to use the money,” said Mason. “Supporting ways to increase the number of younger brains working on solutions is a better use.”

Mason grew up on a farm near Tessier, moving to Saskatoon at age eight where his dad “farmed from the city” northwest of Kenaston. Convinced he wanted to follow in his father’s footsteps, “I thought a four-year program from the college would give me more options.”

The class of 1965 was just 42 students, many who are still friends. Mason recalls typical first-year struggles “but by second year, it became much easier as you get used to the process of university learning.”

He chose to study crop science. “It was foremost in my mind, and it was Dr. (Bill) White’s (PhD) specialty. He was my cub master when I was a kid and became dean the year I graduated.”

Not one to pick favourites among all his college instructors and professors, Mason does give credit to the late Dr. Frank Sosulski (PhD) “for pulling me through” his thesis on grain protein and yield in three prairie locations.

Mason also acknowledged Irene Ahner from Maple Creek, the only woman in the class of ‘65 “and the glue that holds us all together to this day.”

With a degree in hand, Mason headed to Kenaston to join his parents, and immediately acquired seven quarters nearby, complete with a home along the Brightwater Creek. But instead of buying farm equipment, he bought sheep, 80 of them, thinking about the yearly return on investment. In 1973, Mason’s sister and brother-in-law joined him in the operation, and they added another 600 head.

“The whole farm was in grass, but we kept one quarter for grain for feed,” he said. “Learning about raising sheep was a combination of common sense and learning from my mistakes.”

In 1973, Mason was haying a government sheep farm at Mortlach when he decided he needed something to do in the evenings. He went into Moose Jaw, to the public library, looking for books. Being from outside the library region, he was sent to the main office of the Palliser Regional Library, “and this was the lovely woman who helped me get a library card,” he said, gesturing to his wife.

Fast forward four years and Mason heard Greer—then Palliser’s director—



Cora Greer and Bob Mason
Photography by David Stobbe



Bob Mason and Cora Greer's Christmas tree farm.

Photo submitted

being interviewed on CBC about library week in Saskatchewan.

"He heard me introduced as 'Miss' so he assumed I wasn't married," said Greer, who is from the Cabri area, swore she would never marry a farmer, and has a BA from USask and a BLS (library science) from the University of Alberta. "He wrote me a letter through the library and thought I was

rather insensitive because I was slow to respond, but I was on holidays."

They were married in 1980.

"We had a long-distance marriage for 18 years," she said; Greer lived in Moose Jaw with the girls, worked full time and commuted to the Kenaston farm almost every weekend. "No man could have done what she did," said Mason.

To make life easier, Mason got out of sheep and switched to grain farming so he could spend winters in Moose Jaw with his family. He grew wheat, canola, and peas, "but that was a disaster." Inflation at the time made it tough to acquire good-quality equipment, "one reason I kept my job," Greer said.

The day their elder daughter graduated high school, Greer left the regional library and moved with the girls to the farm. "I just changed careers," she said, "but it was hard—the stresses of seeding and harvest, and I would be hauling at midnight with a young child bundled up in the seat beside me, but a lot of women did it."

Then, in the late 1980s, "we planted some pine trees near the house to fill in an empty space, and somebody asked if they were Christmas trees," Mason said, calling it a light-bulb moment. Bob loved trees so he thought "this is a way to diversify."

Mason and Greer planted their first 1,500 conifer seedlings in 1990 and planted more almost every year until 2023, watering, weeding and shearing them through summers.

"In December 1997, we sold 150 trees off the back of a trailer in Moose Jaw," said Greer. It was not easy hauling trees to various sales locations and there were times demand outstripped supply "so we decided to just sell from home."

That was the start of the successful Mason Tree Farm's U-cut operation, and the couple's more than 25-year involvement with the Saskatchewan Christmas Tree Growers' Association (now known as the Prairie Christmas Tree Growers).

In May of 2020, Mason and Greer sold their farm, "leaving a lot of trees for wildlife," said Greer. "People in our area got used to a fresh Christmas tree that lasted a long time. There were a lot of tears when we closed."

The couple now live at Crossmount Village, a retirement community southeast of Saskatoon.

But old habits die hard—among their many activities, Mason and Greer voluntarily tend a few young evergreen trees on the property. ■



Bob Mason and Cora Greer with their family.

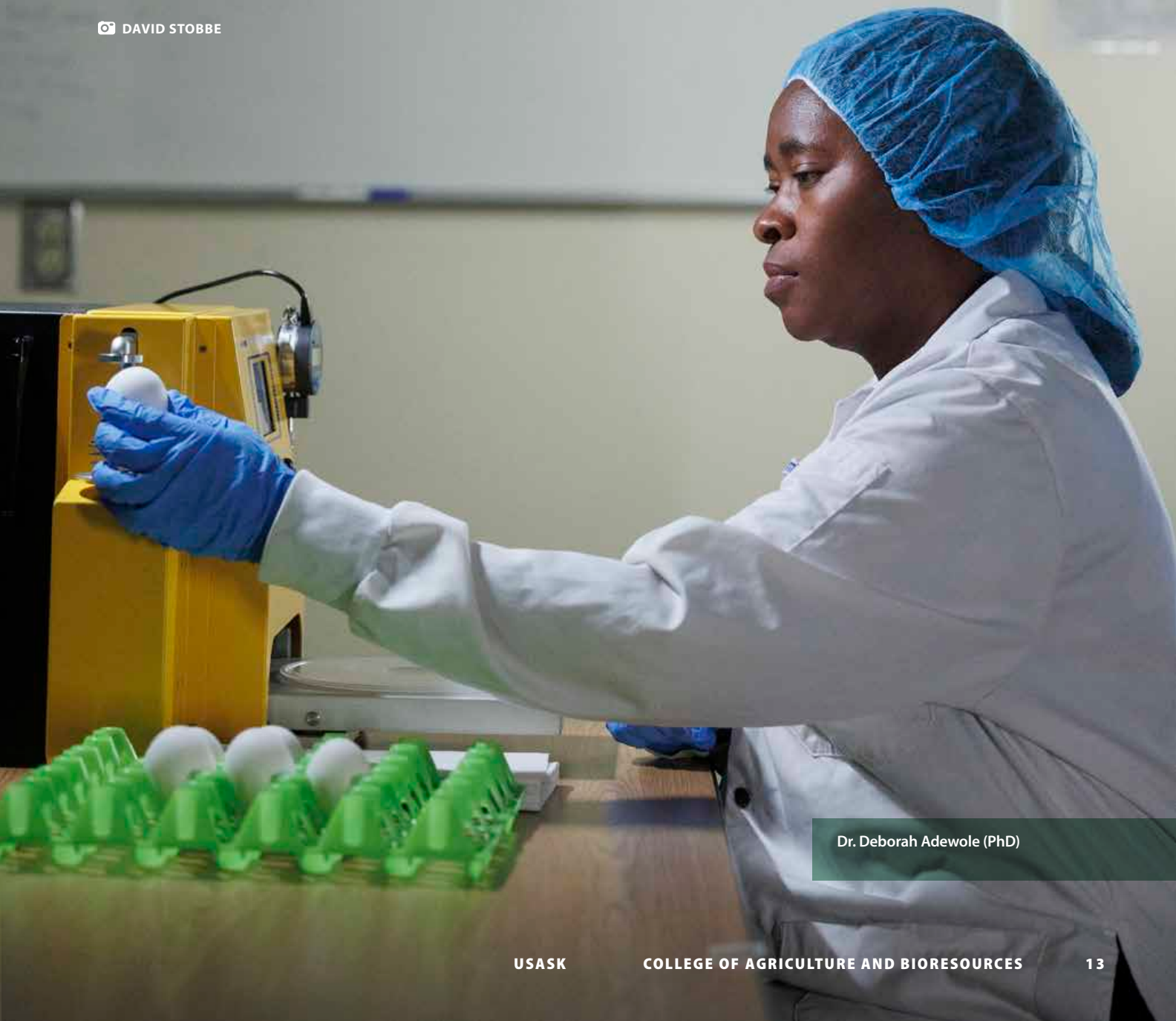
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Innovation in non-ruminant nutrition for a healthier future

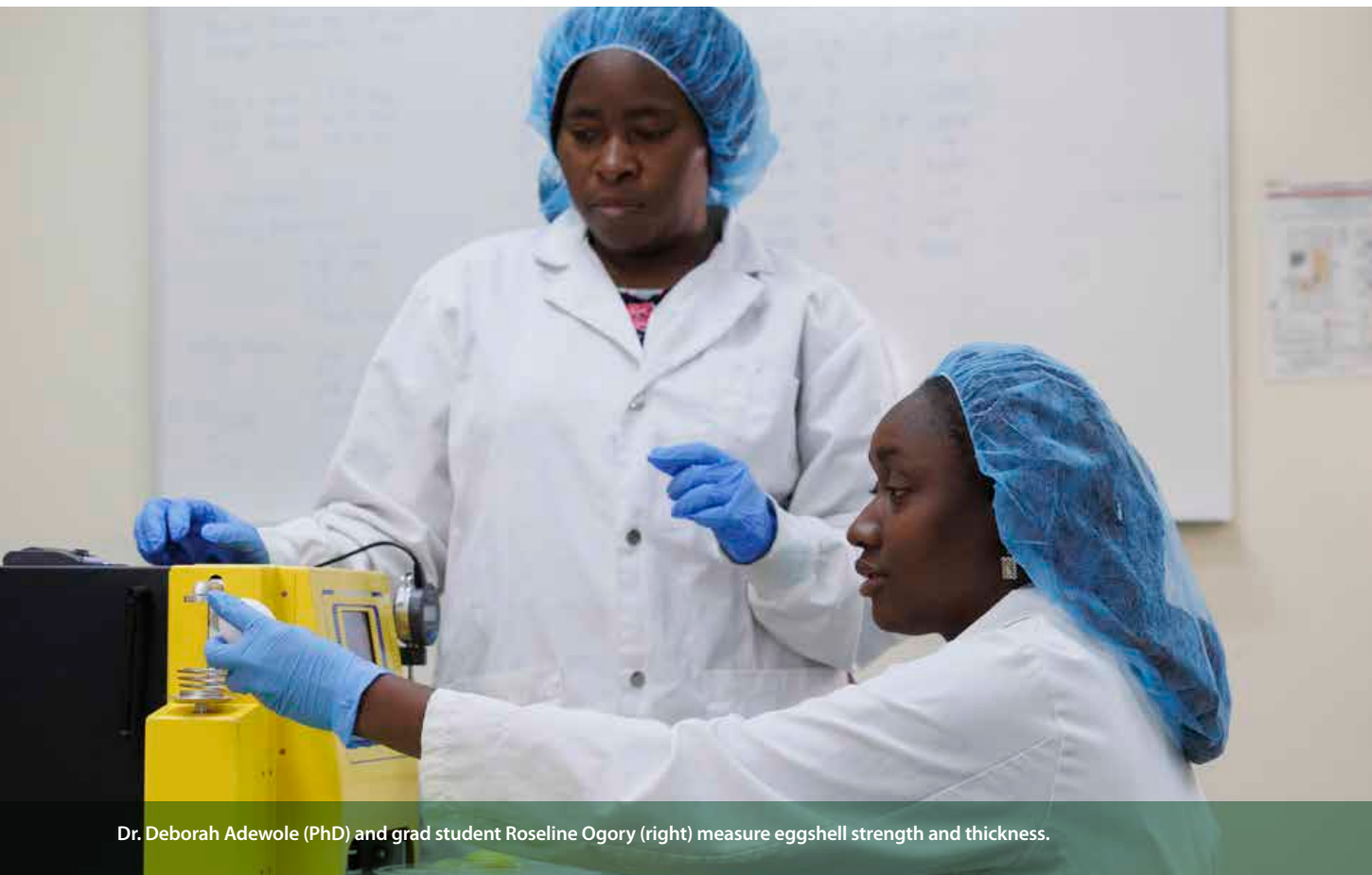
USask's Dr. Deborah Adewole (PhD) looks to make non-ruminant animal production more sustainable through cost-effective and nutritional alternative feed ingredients.

 JANE CAULFIELD

 DAVID STOBBE



Dr. Deborah Adewole (PhD)



Dr. Deborah Adewole (PhD) and grad student Roseline Ogory (right) measure eggshell strength and thickness.

Non-ruminant animals—animals with a single-compartment stomach—play a big role in food security contributing to global food production, the global economy, and overall environmental sustainability. This means that the care of these animals is a significant part of production success, and it all starts with what we feed them.

“Nutrition is a significant part of animal production, as it plays a crucial role in many other aspects, including animal health and welfare, production economics, and it even determines the impact of production on environmental sustainability,” said University of Saskatchewan (USask) College of Agriculture and Bioresources researcher Dr. Deborah Adewole (PhD). “My research questions emerged from a combination of industry challenges, consumer demands, economic and sustainability factors, and regulatory shifts in the way food animals are produced.”

A lot of Adewole’s research aims to find economical alternative feed ingredients from locally available resources, without

sacrificing productivity.

“I aim to help producers find cost-effective alternative feed ingredients to maintain productivity using locally available resources while reducing reliance on conventional feed ingredients, especially those that compete with human food and are thus quite expensive,” said Adewole.

She also wants to support industry as it moves towards cage-free, free-range, or enriched environments to improve animal performance through nutrition. Other real-world benefits of her research include reducing antibiotic use in livestock and improving animal health and resilience.

“I collaborate with organizations, including industry associations at the provincial and national levels, and feed additive companies to make my research more useful and impactful,” said Adewole. “As is evident, even though our research focuses on animals, it offers significant impact on human health, environmental

sustainability, and producer profitability.”

Research that benefits producers and consumers

Her most recent publication explores the use of ahiflower seed and presscake in poultry nutrition, showing an increase in omega-3 fatty acids in egg yolk—a polyunsaturated fat linked to improved heart health in humans.

“The ahiflower press cake is a waste product that can be sourced locally in Canada,” said Adewole. “Globally, my research lab is the first to utilize ahiflower seed and press cake in poultry nutrition. That is the kind of novelty my lab offers the industry as we support them in finding practical solutions to prevailing challenges.”

Her research also explores reducing the need for antibiotic use in livestock using bioactive substances—work that is crucial for combating antimicrobial resistance and meeting consumer demand for antibiotic-free meat and egg products.



Dr. Deborah Adewole (PhD)

“My research also explores how natural additives including probiotics, essential oils and microencapsulated multivitamins can improve gut morphology, microbiome, immune response, and overall resilience of animals under heat stress and cold stress, leading to healthier animals, lower mortality rates, and better productivity and profitability for farmers,” she said.

Inspiring young farmers around the world

Adewole and her husband co-founded an organization called International Youths in Canadian Agriculture (IYCA), which is dedicated to empowering young people, particularly international students, to build meaningful careers in agriculture.

“We focus on bridging the gap between youth and the agricultural industry by offering mentorship, education support, one-on-one training, and career development,” said Adewole.

The not-for-profit organization recruits and guides young people and those

who are new to Canada into agricultural education, helping them find meaningful career pathways by connecting them with mentors, industry professionals, and hands-on training programs.

“Agriculture is the backbone of society, and we are committed to helping youth discover meaningful pathways into careers in the industry,” she said.

From coastline to Prairie skies

Adewole joined the USask Department of Animal and Poultry Science as an assistant professor in 2023. Prior to this, she was an assistant professor and research chair in the Department of Animal Science and Aquaculture at Dalhousie University in Halifax. She says the college’s ability to collaborate with industry leaders and government institutions to ensure research that is practical, impactful, and aligned with industry needs was an attractive quality.

“USask offers a unique blend of history, innovation, and infrastructure

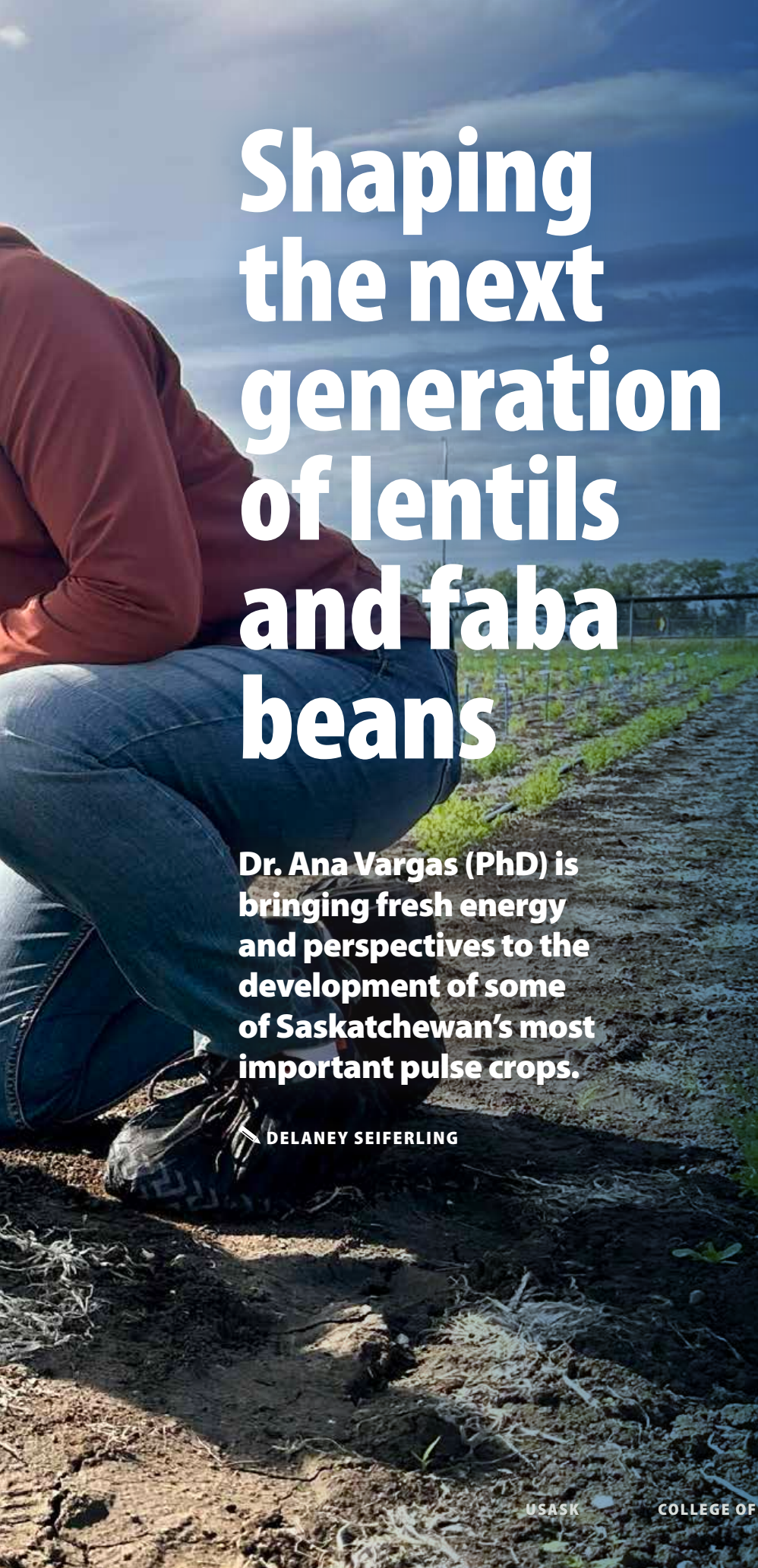
that supports cutting-edge research in the field of agriculture. Being a global leader in agricultural research, USask also offers robust opportunities to train undergraduate and graduate students and early-career researchers,” said Adewole. ♥

“My research questions emerged from a combination of industry challenges, consumer demands, economic and sustainability factors, and regulatory shifts in the way food animals are produced.”

DR. DEBORAH ADEWOLE (PHD)



Dr. Ana Vargas (PhD) and USask graduate student Taylor de Jong examine plants in root rot nursery.
Photography by Kira Glasscock



Shaping the next generation of lentils and faba beans

Dr. Ana Vargas (PhD) is bringing fresh energy and perspectives to the development of some of Saskatchewan's most important pulse crops.

DELANEY SEIFERLING

Dr. Ana Vargas (PhD) only stepped into her current role as the head of the lentil and faba bean breeding program at the University of Saskatchewan's (USask) Crop Development Centre (CDC) a year and a half ago.

But she already has a favourite part of the job—going out in the fields surrounding her office first thing on summer mornings and looking over her plots while drinking her coffee.

"It's basically seeing your whole year of efforts, because everything we do throughout the year is just to get to that very important moment. It's just very special," said Vargas, the Agri-Food Innovation Fund Chair, Lentil and Faba Bean, at USask.

These crops represent not only the hard work of breeders like Vargas, they also represent a cornerstone of the Saskatchewan and Canadian economy. Our province grows more than a third of the world's lentil supply, while the provincial pulse industry is valued at about \$6.3 billion annually.

The strength of this sector simply wouldn't be possible if farmers did not have access to new and improved pulse varieties each year. And Vargas' job is to ensure they do, by prioritizing and balancing the needs of farmers—developing crop varieties that are adapted for growth in Saskatchewan's conditions, resilient to changing weather patterns, responsive to global market, and are safe, nutritious, affordable and innovative.

She does all this by spending countless hours in the lab, using a combination of new technology and traditional breeding methods to generate new varieties of lentils and faba beans that will offer marked improvements over previous ones.

And she's made much progress in doing so in her short time on the job. In the last year, seven new lentil varieties from the CDC program have been approved for registration, which means they are one step closer to being planted in farmers' fields.

Vargas says she is proud of all seven varieties, as they all offer marked improvements over previous ones—including increased resistance to some of the most noxious diseases plaguing Saskatchewan pulse crops at the moment and improved marketing traits, such as shapes and colours that make them easier to get to end markets. For example, one new small red lentil variety is much rounder than previous versions, which will make it much easier to process.



Dr. Ana Vargas (PhD)
Photography by Chris Hendrickson

"It's probably going to be at least 20 per cent more efficient for dehulling than the previous [standard]," she said.

The program has also bred new varieties of black lentils with improved seed quality. Previously there was only one variety available—Indianhead—developed as a legume cover crop.

"We have a lot of new findings showing why black lentils are better agronomically and for

processing," Vargas said, adding they also believe the black colour adds additional protection against root rot (a disease which has cost Saskatchewan farmers billions of dollars in losses in recent years). She believes the colour could also be appealing to end users for aesthetic purposes.

Beyond lentils, Vargas is also extremely optimistic about the faba bean side of the program, as she believes this is an up-and-coming crop in Saskatchewan.

In 2023, Saskatchewan farmers grew 89,000 acres of faba beans (compared to more than 3.5 million acres of lentils) but she is confident that number will increase, as the crop offers so many benefits to both farmers and end users.

One of the advantages is their benefits for the soil.

"They will fix four or five times more nitrogen than any of the other [pulse] crops," Vargas said, meaning they require fewer synthetic fertilizers to grow, and they also leave beneficial, natural residues in the soils for the next crop to uptake.

Faba beans also have a protein content of 25-35 per cent, without

a strong associated flavour, making them ideal for marketing at a time when global demand for protein, and plant protein sources, is increasing steadily.

"It's the right time to promote any high-protein crop," Vargas said.

Finally, they are less susceptible to some of the major diseases that affect other Saskatchewan pulse crops.

Previous generations of breeders at the CDC have already done much of the heavy lifting to make faba bean varieties that are suitable for human and animal consumption, Vargas says, so now her focus is on improving agronomic traits, such as smaller seed sizes, higher yield potential, and stronger overall plant architecture.

Another agronomic focus will be on shortening the number of days it takes for the crop to mature.

"When you have a crop that fixes that much nitrogen, it's about finding that sweet spot to let the crop fix enough nitrogen, but we can't let it go forever. We need the crop to mature in time to harvest."

Beyond agronomics however, she's also looking to make new varieties with appeal for end-use markets in terms of colours and shapes. For example, there's a small, black variety in the works, as well as a purple one.

She says having a variety of options for farmers to grow, and markets to buy, is key to ramping up the potential of the crop.

"It can certainly become the next big pulse crop in Saskatchewan, in my opinion, and many people will agree with that."

Being able to help diversify options for farmers and strengthen the industry overall is a point of pride for Vargas, who grew up on a small family farm in Central America, before going on to study at universities in Honduras and Puerto Rico. She believes her background has played a critical role in getting her to where she is today.

"I come from a farming family and my perspective will be always the farmer's perspective, and I think that's a beautiful opportunity to have in this job," she said. "I will always consider my background beneficial."

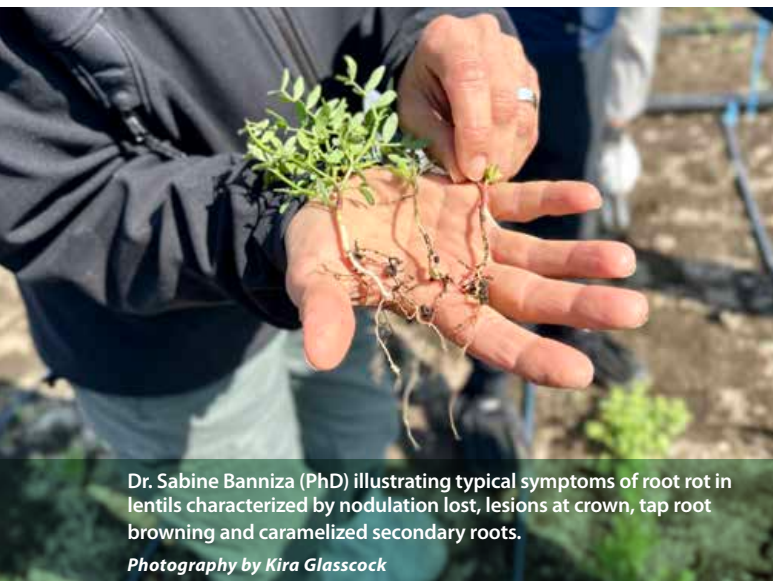
But her vast experience and education doesn't mean she has nothing left to learn. In fact, she says the last year-and-a-half has been a major growth period for her professionally.

"There's just an endless list of what I have learned," she said, adding that one of the best parts of her job as an assistant professor in the College of Agriculture and Bioresources' Department of Plant Sciences has been teaching the next generation of plant breeders.

"I've learned so much not only from my peers, but from my students. I think I have the luxury to have some of the best students that you could ever ask for."

Going forward, Vargas plans to continue to support her students as they embark on their own careers and journeys, as well as the farmers that rely on the crops she's breeding. And Vargas is grateful for the opportunities she's been given to do so, especially at a time when there is so much potential for plant breeders to rapidly advance their work through new technology, and address increasingly important global concerns related to food security and climate change.

"My generation has the luxury to have learned the traditional ways of breeding and still be moving into rapid genomic development. So, I just feel really lucky to be living in this time." ■



Dr. Sabine Banniza (PhD) illustrating typical symptoms of root rot in lentils characterized by nodulation lost, lesions at crown, tap root browning and caramelized secondary roots.

Photography by Kira Glasscock

Wilderness wanderer to climate warrior

Dr. Bryan Mood's (PhD) passion for the Earth has led him from Nova Scotia's forests to teaching environmental science at USask.

 JOANNE PAULSON



Dr. Bryan Mood (PhD)
Photography by David Stobbe



Field School in Renewable Resource Management: Students collect tree biological information from a small muskeg north of Candle Lake, Sask. to estimate the age of the black spruce (it was approximately 70 years old!).

Photography by Bryan Mood

As a youngster, Dr. Bryan Mood (PhD) would frequently get lost in the wilds of southwestern Nova Scotia.

At the time, no one knew those experiences would lead to an academic career, but the foundations of his passion for environmental science were clearly built early in life.

"From that I always had an interest in forests, in wetlands, being in them and trying to understand them," Mood said.

Today, three degrees later, Mood is a lecturer and the Renewable Resource Management Program Co-ordinator in the Department of Soil Science at the University of Saskatchewan (USask). His lifelong connection to the land has also led him to additional passions for connecting with communities, particularly Indigenous ones.

His first degree was in environmental science at Mount Allison University in Sackville, N.B. He then moved to the University of Victoria, where he earned his

master's and PhD.

"A lot of that was looking at paleoclimate and what the earth has looked like in the last 10,000 years and the last 300 years," he said, noting that included evaluating glaciers and water resources via tree-ring reconstructions in B.C.

"What my supervisor (Dr. Dan Smith (PhD)) was really driving home was understanding the landscape and how it informs us about different things—whether it's what the glaciers are going to do, what the trees are going to do, what the risks are to snowpacks, snowmelt, all these different variables."

Now studying climate change, his understanding of historical weather information is very helpful. For example: How does one know if an area is experiencing a one-in-100-year drought or flood, if you only have 30 years of record?

"That's where paleoclimatology and these reconstructions come in. They provide additional context to resource

management questions."

Mood went on to serve as executive director of the UNESCO Southwestern Nova Biosphere Reserve Association, where he and his team developed a climate atlas—a kind of ecotourism website that still exists at climateatlas.ca.

It was at this time in his career that he learned of, and began to adopt, the concept of Two-Eyed Seeing, inspired by Elder Albert Marshall of the Eskasoni First Nation. Mood describes it as a way of viewing things through western science and traditional Indigenous ways of knowing.

That was the beginning of his vision for teaching and learning, "getting that multiple perspective on different environmental issues."

For example, his recent research is around carbon storage. With mapping, he has identified almost 30,000 square kilometres of native aspen copses in Saskatchewan's prairies alone.

"We're developing regional scale growth curves to establish how much carbon is stored in them," he said. "Some landowners like to take those out, but they offer a lot of ecosystem services."

"Those copses have a halo effect so around the rim of them we know that crop production increases 30 to 100 metres out from them."

"We're trying to get a better understanding of this for best management practices. Obviously, they're a nuisance, but is the nuisance worth it?"

Shelterbelts to Stantec to USask

Mood came to Saskatoon for the first time as a post-doctoral researcher in the College of Agriculture and Bioresources (AgBio) for the Agricultural Greenhouse Gas Program 2.

"We looked at shelterbelts, which are all over the Canadian Prairies, and we were trying to find a way, a decision support tool, to understand what their risks are associated with environmental conditions. Are they going to die because of these droughts that we're seeing, or are they going to die in 30 years because the moisture deficits are too great, or is it temperature-related?"

The research was intended to help landowners decide which species were best to plant, and the website, shelterbelt-sk.ca,

still gets about 1,000 hits per month.

His next position was with Stantec Consulting where he was part of their national Climate Risk Resilience and Sustainability team.

"I was part of the national group where any engineering project required climate risk assessments. Thinking about instead of building for the now, we're thinking about building for the future and providing those recommendations to engineers around how to future-proof buildings and towns."

He returned to AgBio in 2023 and took on a class that Dr. Tom Yates (PhD), now the associate dean, had taught for a decade. Yates' expertise is in soils, with Mood's expertise in forests. He added more forest components while continuing Yates' tradition of working with real clients and real outcomes, along with his students.

He challenges them through "open inquiry," getting them to think of projects and subjects that excite them, then twist them into something that makes sense with the course materials.

"My teaching pedagogy is heavily focused around Tobler's First Law, which is that everything is connected to everything else, but near things are more connected than distant things," he said. "That's not just in terms of space, but also in terms of time, emotion, social structures—there are multiple ways to think about that."

For example, one student was encouraged to write a project on food security in a class on permafrost. Permafrost affects northern airport runways, which in turn affects food security.

"We were saying, well, this airport is located in a very vulnerable location. It obviously will be affected by climate change permafrost degradation. No food, no medical evacuation, no anything like that."

Indigenizing the curriculum

The permafrost project serves as an example of his focus on Indigenizing his teaching.

"One of the big things I wanted to do when I came to the University of Saskatchewan was really Indigenize the resource management curriculum. Tom had been doing a wonderful job of that," he said.



Students classify a forest soil at the Boreal Ecosystem Research and Monitoring Sites – Old Black Spruce (BERMS-OBS) in September 2025 as part of the Soil Science 460 class.

Photography by Bryan Mood

Mood is applying the Two-Eyed Seeing principle in all his curricula, such as his forest ecology class, which carries themes of reconciliation and reciprocity.

"I do a plant identification and soil identification class as well, and as part of reconciliation, I've included the Cree names of the plants we look at and their traditional uses as well. We focus on Cree for names so all the names we would provide, along with the medicinal, technological and food uses."

By the end of that class, students began to grasp that a lot of species often thought about in silos, such as birch or alder, have similar medicinal characteristics and grow in the same environments.

"They're all part of the willow family so they have acetylsalicylic acid, which is aspirin, basically."

With senior undergrads, Mood is also running an applied environmental project with the Little Pine First Nation, the first part of a 10-year project on food sovereignty,

with the support of the college's kichi-okāmimāw askiy (Great Mother Earth) Knowledge Centre.

The First Nation is in a food desert, Mood describes, with the closest grocery store 70 kilometres away. His group is evaluating how the community can grow its own food, including fresh vegetables and livestock.

"We don't want to helicopter in and leave. We want to do as much as we can in the community," he said. "That project, and class, itself is an act of reconciliation and providing information they want."

They also visit schools in the area and work with Grades 10 to 12 students on their projects.

"My dream is that I have a student in five years' time that came from one of these schools that we visit and have this full-circle reciprocity." 🍀

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We also thank those who have made commitments to the College of Agriculture and Bioresources through their estate plans. These arrangements help us shape and secure the college's future.

Together, we raised **\$570,739,155**

The University of Saskatchewan is proud to celebrate crossing the finish line of the largest campaign in Saskatchewan's history. With your support, **\$570,739,155** was raised through the *Be What the World Needs* campaign.

These funds have been, and will be, used to support student success, critical research, Indigenous achievement, and design and renovate visionary spaces. Thanks to your generous support we have been able to address the issues affecting our students, our country, and our world. We can't wait to see what else we can achieve together!

SUPPORTER SPOTLIGHT



Funding announcement for the new Harrington Plant Growth Facility and the Soil Science Field Facility held on May 22, 2025.

Photography by David Stobbe

New USask infrastructure to bolster agricultural research

USask received \$11.8 million in funding for two new facilities, the Harrington Plant Growth Facility and the Soil Science Field Facility, to provide critical workspace for crop and soil science research and teaching.

The project also includes a renovation to a portion of the Crop Science Field Lab at USask to provide additional workspace for the Crop Development Centre. Construction is underway and is expected to be completed July 2026.

Funding for the project includes \$7 million from Western Grains Research Foundation (WGRF), \$2.3 million from the Saskatchewan Wheat Development Commission, \$1 million from the Saskatchewan Ministry of Agriculture through the Sustainable Canadian Agriculture Partnership (Sustainable CAP), \$850,000 from the Saskatchewan Barley Development Commission, and \$400,000 from the Saskatchewan Oilseeds Development Commission.

Additional funding has also been provided by BASF Canada, the Saskatchewan Cattle Association, SeCan, Bob and Norma McKercher, the Saskatchewan Alfalfa Seed Producers Development Commission, the Saskatchewan Forage Seed Development Commission, and SaskOats.

New USask crop research chair receives Sask Wheat support

The Saskatchewan Wheat Development Commission (Sask Wheat) has committed \$6.5 million to support the establishment of the Saskatchewan Wheat Development Commission Applied Genomics and Pre-breeding Chair at the University of Saskatchewan (USask).

The chair focuses on applying genomics to pre-breeding activities and bridge the gap between discovery research, exploration of gene banks, genomics and breeding.

Dr. Valentyna Klymiuk (PhD) has been appointed to the position and began August 1, 2025.



Dr. Valentyna Klymiuk (PhD)

Photography by Matt Smith



Nutrien gift announcement held on February 3, 2025.

Photography by Matt Smith

Nutrien supports Be What the World Needs Campaign with transformational \$15 million donation to USask

On February 3, 2025, Nutrien announced a \$15 million gift to the University of Saskatchewan (USask) to drive a new era of innovation, collaboration and success.

A large portion of the gift will establish the Nutrien Centre for Sustainable and Digital Agriculture, housed in the College of Agriculture and Bioresources. The donation will also establish the Nutrien Future Fund for the college, provide scholarships for AgBio students, and fund Indigenous and community engagement initiatives via the kihci-okāwimāw askiyi (Great Mother Earth) Knowledge Centre.

Science, sustainability, and storytelling

Meet USask alumna Jenna Sarich (BSc(AnBiosc)'19, MSc'23), an up-and-coming voice in Canadian beef research.

 **MICHELLE BOULTON**

Like many of her classmates, Jenna Sarich came to the University of Saskatchewan (USask) to study animal bioscience in 2014 with dreams of becoming a veterinarian. However, a formative summer job redirected her ambitions.

While working for Agriculture and Agri-Food Canada in Lethbridge, Alta., she joined Dr. Karen Beauchemin's (PhD) research group investigating feed additives to reduce methane emissions from beef cattle.

"I absolutely loved the research and quickly became fascinated by the metabolic and physiological factors that influence animal health, performance, and well-being. That spurred me to pursue research," she said.

In 2019, she returned to USask to begin a Master of Science under the supervision of Dr. Gabriel Ribeiro (PhD) in the Department of Animal and Poultry Science in the College of Agriculture and Bioresources. She studied the effects of ergot alkaloids on ruminal metabolism, cattle health, welfare, and performance.

Sarich completed her research at USask's Livestock and Forage Centre of Excellence, where she also took on a role as an outreach worker.

"I really enjoyed interacting with the public and taking technical research and making it digestible for people in industry and elsewhere," she said.

These experiences uncovered a flair for science communication that would become central to her career.

Her next role, in 2022, was with the Canadian Cattle Association working as the technical consultant for public and stakeholder engagement. Later, her role expanded to a joint position with the Canadian Roundtable for Sustainable Beef, communicating the findings of the National Beef Sustainability Assessment.

A photograph of Jenna Sarich, a young woman with long blonde hair, smiling and standing in a vineyard. She is wearing a black jacket over a white shirt and blue jeans. She is holding a bunch of green grape leaves. In the background, there are rows of grapevines covered with protective netting, and a rolling landscape with hills and trees under a clear sky.

Jenna Sarich at a farm in southern France during a 6-week global tour for the Nuffield Global Focus Program.

Photo submitted

"It let me flex my science brain and then present the information," she said. "I've talked about the assessment in almost every province in Canada and even internationally."

Finding a global community: Embarking on her Nuffield Scholar journey

It was during one of those international presentations, at the World Food Forum hosted by the Food and Agriculture Organization of the United Nations, that Sarich discovered the Nuffield Canada Agricultural Scholarships. At the event, she met a group of Nuffield scholars and instantly knew she'd found her next step.

"I love travel, I love learning, I love research—it was a perfect combination," she said.

In 2024, Sarich was selected as one of four Canadian Nuffield Scholars—joining a group of roughly 90 scholars from 16 countries. Scholars must complete at least 10 weeks of travel study within 24 months to research a topic of their choosing. Sarich's topic is the sustainability of beef cattle systems.

Her Nuffield travels began in March, when all the scholars gathered in New Zealand for the Contemporary Scholar Conference. She then travelled throughout New Zealand and Australia for six weeks.

In May, she was able to participate in an optional Global Focus Program, thanks to secondary sponsorship. The six-week whirlwind tour took her across three continents and six countries—Singapore, Qatar, Belgium, France, Ireland, and Brazil.

"You start at the government level, learn about the policies and regulations of each country, and then go out onto different farms and research centres to see where the challenges and opportunities are," she explained.

By the end, she and her fellow scholars were a close-knit group.

"We're going to be friends for the rest of our lives," Sarich said, adding that they have become part of the global Nuffield network. "Being able to go to any country and immediately have a community is such a cool thing."



Jenna Sarich (right) with her fiancé Lukas McConechy.

Photography by Jessica Davey

Lessons from the field: Sharing her insights

What has she learned? Sarich says almost every country is struggling to get young people interested in agriculture, which she describes as "the number one thing the industry globally needs to work on."

Food security is also a pressing concern. Many countries are urgently working to increase domestic food production and trying to be more self-reliant, sometimes in the face of significant challenges. Coming from Canada, a country that produces a lot of food and exports much of it, she was reminded of the vital role global trade and market access plays in feeding the world.

In terms of her research topic, Sarich has been exploring sustainable beef production from a holistic perspective that considers the ecosystem benefits of having cattle on the land.

"When people talk about sustainability, they think it only means environment. But you also need to consider the social and economic aspects," she said. "There's no way you can implement a new technology if it's going to put a financial burden on a producer. It's never going to be sustainable."

Sarich's Nuffield experience will culminate in a report that will be published on their website. She's also sharing what she's learned on social media (@jenna.sarich on Instagram), writing articles, and

speaking at conferences. And she's on a mission to raise awareness of the Nuffield program.

"Usually when I talk about Nuffield in Canada, I have to describe what it is. In other countries, it's quite well known. I really want to increase awareness when I'm disseminating my findings so more people can get the chance to be scholars."

Advice for the next generation: Go for it!

What does Sarich want young people—especially women—considering agricultural science to know?

"Don't let imposter syndrome keep you from doing what you want to do. Everyone feels like that, even people you admire," she said. "Don't let doubt stop you from applying or pursuing something."

As for her own future, Sarich eventually plans to return to academia.

"I really want to work in industry for a while to get a good feel for where the research gaps are," she said. "But I do want to do research of my own and I want to pursue a PhD, probably at USask."

For now, she's content to keep learning, exploring, and sharing Canada's story with the world—her Saskatchewan roots grounding her, even as her discoveries span the globe. ♥



Dr. Darren Korber (PhD) knows that the University of Saskatchewan's (USask) Department of Food and Bioproduct Sciences is not as well-known as some of the larger departments in the College of Agriculture and Bioresources.

But the department punches above its weight in terms of, amongst other things, the importance of its ongoing research.

Powered in part by the capabilities of its recently revamped fermentation pilot plant, researchers in the department are addressing some of today's most important global issues, including food security and sustainable resource use, while also exploiting Saskatchewan's natural resources to deliver innovative and valuable new products that will boost our economy and address global issues.

"When it comes to agriculture, most people think farmgate—soil science, plant science, crop development, animal science," said Korber, who has been head of the department for six and a half years.

"We are the less-known entity in agriculture. But we have a lot of really, really good things going on in our department, in so many different areas," he said.

The discipline of food and bioproduct science—which combines biology, chemistry, microbiology, engineering, and nutritional knowledge to understand and improve how we transform raw agricultural materials into safe, nutritious and sustainable products—has perhaps never been more important.

And Saskatchewan is uniquely positioned to deliver these solutions. Rich in agricultural production in general, it is also a global leader in growing nutrient- and protein-dense pulse crops, which represent significant untapped potential in terms of advanced protein extraction, fermentation and novel ingredient development.

Saskatchewan is also home to scientific institutions such as



Changing the future of food

USask's Department of Food and Bioproduct Sciences taps into the potential of fermentation, protein extraction, and ingredient development.

 **DELANEY SEIFERLING**

 **DAVID STOBBE**

Dr. Darren Korber (PhD) with USask graduate student Kiranbir Kaur in the fermentation pilot plant.

USask, that are leading the way in terms of innovation and academic expertise in this area.

The Department of Food and Bioproduct Sciences is a prime example of this, as exemplified by some of its ongoing research.

For example, Dr. Mike Nickerson (PhD) has developed a pulse-based microcapsule, designed to improve the absorption of probiotics and prebiotics in humans and animals, while Dr. Haixia Zhang (PhD), a recent new hire, is developing vegan meat alternatives using fermented mushroom mycelia as a base. Dr. Xiao Qiu (PhD) is working on ways to get plants and microbes to naturally produce healthy omega-3 fats, important for brain health, heart function and overall growth.

Another exciting development for the department has been the fermentation pilot plant, which has been updated in recent years with brand new equipment, technology and expertise.

This was an important move for the department, Korber said, as there has been renewed interest in this bioprocessing method in recent decades, given that it offers a natural, sustainable way to enhance nutrition, preserve ingredients and create new products with less environmental impact. It also enables the development of innovative plant-based foods, functional ingredients and bioplastics—helping meet global demands for healthier diets and greener technologies.

Now, one of the department's main focuses is looking at the potential to use fermentation to optimize the potential of Saskatchewan pulse crops, often done in collaboration with faculty with expertise in proteins, enzymes and microbiology.

Pulse crops are often separated during milling processing into different fractions that include protein, starch, oil and fibre, Korber said. Protein-based fractions, the highest value component, can

be incorporated into food and feed products to add a nutritional boost but they can also be poorly digestible and not nutritionally optimal.

“Using fermentation, we can improve digestion and get rid of anti-nutritional factors that interfere with digestion,” he said.

Other researchers, including Dr. Yongfeng Ai (PhD), are trying to figure out potential new uses for the starch-rich fractions of pulse crops.

“We’d like to improve the quality of that starch because right now it’s a low-value byproduct,” Korber said. “We can ferment the starch, along with inexpensive nitrogen sources, to convert it into microbial protein and we end up with a product that could be put into, say, an animal feed.”

More recently, the university has also begun contracting the lab out to third party companies who are looking for support in their own fermentation projects, which often includes de-flavouring or deodorizing food ingredients, or improving their nutritional profiles. This type of work can also include longer-term projects developing prototypes and testing them before investing in scale-up endeavours.

“These things don’t all happen at once with the snap of the fingers,” said Korber.

Perhaps one of the most important functions of the fermentation lab, however, is training the next generation of food and bioproduct scientists, who are already blazing trails and doing high impact work in their respective areas, Korber said.

In fact, this reflects one of the best parts of working in this program, in his opinion: faculty and students can follow their own paths and do research that reflects their personal interests or has special meaning to them.

“They can do whatever they envision, bounded only by their imagination,” he said.

One of the current members of the faculty is a perfect example of this. Dr. Christopher Eskiw (PhD), an expert in nutrigenomics, has explored a wide range of topics related to aging and dementia but more recently has diversified his research interests to include using yeast to increase the health of the gut microbiome in animal systems.

“Now he’s applying his high-powered nutrigenomics and genetics expertise to yeast and beer quality,” Korber said. “He’s leveraging his deep background in biochemistry and genomics to explore how gene expression in yeast influences beer traits—work that’s highly relevant to the needs of the competitive microbrewery sector.”

Eskiw also leads research related to how to process yeast to target different flavours in small-scale brewing operations.

This reflects another area of expertise of the program, Korber said, which has long supported the local craft and spirit brewing industry through research and innovation.

In light of this, the department launched its first undergraduate course specific to the topic this fall, alongside a brewing club that will begin January 2026. This could potentially lead to the development of a more formal program for the discipline if the interest continues, which Korber expects it will.

Given this diversity of options for study, and the importance of the research being done, Korber hopes more students will consider this discipline as a potential area of study going forward.

He also urges people to consider the experiences and impact they could have with a career in food and bioproduct sciences.

“There is just really cool stuff going on in our program, with excellent career options on the other side.”



USask graduate student Mariyam Hussain in the fermentation pilot plant.



“Be prepared for big things” from the Nutrien Centre for Sustainable and Digital Agriculture

**New collaborative hub is now
being created in USask’s College
of Agriculture and Bioresources.**

JOANNE PAULSON

When Nutrien announced a \$15 million donation to the University of Saskatchewan (USask) in February—with a large portion going to a new centre within the College of Agriculture and Bioresources (AgBio)—its founding director did not hold back on expressing

the vision for the exciting new venture.

“Be prepared for big things,” Dr. Steve Shirliffe (PhD) remembers telling those assembled at the event.

“We are unabashedly ambitious, and we are building it out to become a world-class centre.”

Thus, the concept of an interdisciplinary

high-tech agriculture hub, which had been under discussion for two years, became the Nutrien Centre for Sustainable and Digital Agriculture.

Soon to occupy part of the first floor of the Agriculture Building, the centre has a massive purpose: applying digital technology to increase the sustainability of agriculture.



Dr. Steve Shirliffe (PhD), director, Nutrien Centre for Sustainable and Digital Agriculture

Photo submitted

It is not a small nor a limited endeavour. For College of AgBio Dean Dr. Angela Bedard-Haughn (PhD), sustainability has three main aspects: economic, environmental, and social.

"All those pieces come together to make something that is actually sustainable," she said. "If we're thinking about an environmentally sustainable practice in agriculture, if it's not economically sustainable or if it's somehow damaging to the social fabric, then that's not actually sustainable."

She noted that USask, as well as Western

Canada, is already "doing a lot of great work" in sustainability.

"There are all kinds of data to support that we have one of the lowest environmental footprints in terms of agricultural production, large-scale annual crop production as well as livestock production. How can we continue to raise the bar? How can we continue to do better?"

The relatively new world of digital technology, from satellite mapping, drone use, data collection and associated crop and soil evaluation, will indeed raise

that bar.

"Digital agriculture in the broadest sense is agriculture that is leveraging the power of large data sets, and those might be collected by a producer through their yield monitors; data collected through soil sampling, crop scouting. Farmers are constantly collecting data about their sites," the dean said.

"It's also the development of new tools to measure the sustainability, so not just remote sensing but maybe the development of sensors that we can use in the field to get more rapid measurement than our traditional approaches of taking a sample back to the lab for chemical analyses."

Staff and collaboration

Bedard-Haughn broached the idea of becoming the centre's first director to Shirliffe, a professor in the Department of Plant Sciences, in December. He didn't think twice before agreeing.

"I was ... yeah. Put me in coach," he said.

"I feel extremely privileged. I've thought a lot about this. People talk about a once-in-a-lifetime opportunity, but to get the chance to be part of the team that builds a new centre, to lead that, it's more than you can even hope for."

Shirliffe and his team run the existing agronomic crop imaging lab, which includes a field research program. It started about 10 years ago, when he bought a drone, started flying it with a post-doctoral student, and applied for funding.

He was part of a team that landed the largest research grant USask had ever received at the time.

"That allowed us to really get going, really to establish ourselves in this area of digital agriculture," he said.

They moved into larger scale satellite modelling of crop production, crop yields, soils and weather, as well as other agri-environmental predictions, such as estimating nitrous oxide emissions.

"We're in the process of moving to doing

wall-to-wall mapping for all of Western Canada for all the cropland in Canada. It's quite unique," he said.

"That process is indeed going to be the first research platform that the centre officially offers. We're bringing other people into this digital sandbox, if you will. We have all this data available."

The "sandbox" will welcome scientists from all over campus and beyond, the dean noted.

"This was a natural growth out of collaborations that are already happening," she said.

"Through some of the previous projects that had previously been done on campus, there had been relationships with engineering and computer science and the people you would expect collaborating in the digital agriculture space."

That network is expanding through a recent cluster hire of five new AgBio faculty members in sustainable and digital agriculture: four are in place, and the fifth will arrive in January 2026.

"We view it as a collaborative space with some people permanently there managing the data," added Shirliffe.

"We will have a concierge type of position where people can bring in data they have—maybe someone doing work on the effect of land cover on the density of birds, like Dr. Christy Morrissey (PhD) is doing over in biology, and have the geospatial data to model what environment, ground cover, and farm management variables are driving their species abundance."

Training and the future

The centre will also offer a spectrum of training, from workshops to formal certificates and degrees.

"A lot of the folks working on digital ag right now evolved into this over the course of their careers," said Bedard-Haughn. "And now we are at that stage where there are bright young scientists that have explicitly trained in this space and are the future in this area of research."

"A lot of the folks working on digital ag right now evolved into this over the course of their careers. And now we are at that stage where there are bright young scientists that have explicitly trained in this space and are the future in this area of research."

DR. ANGELA BEDARD-HAUGHN (PHD)

Shirliffe said a precision agriculture certificate is already in place. It began two years ago and has been an enormous success beyond his wildest dreams. The first year accepted 90 students, but it was so popular that the introductory course had to be expanded and now has 130 students.

The centre also supports an advanced precision agriculture course and yet another new course is being developed by Dr. Bryan Mood (PhD) in agricultural global geographic information systems (GIS).

Shirliffe hopes that within two to five years, there will be resources to add a certificate at the post-graduate level, so graduates can take the courses online. The centre will also provide more visibility for a graduate-level computational agriculture program that was developed by faculty in Plant Sciences and Computer Science.

The physical space for the centre will be created off the Agriculture Building's atrium.

On the outside will be an outreach display that people can interact with to understand what's happening on the land around them. Shirliffe expects to also develop apps for farmers—and others—

on the outreach side.

"People always relate to the sense of place they have here in Saskatchewan," Shirliffe said. "In some cases, they'll be able to see historic photos of farmyards, how variable the land is, what the weather is like, the soils, the crop growth."

Precision animal management will also be incorporated into the centre's offerings, as well as a collaboration zone and space to meet with stakeholders, which is important because the centre plans to partner with industry as well.

"The space is going to have a high-tech feel, with glass so people can see in, and hopefully we will continue to catalyze this interest in digital agriculture. Our grand goal is to make Saskatchewan a centre for digital agriculture as we are for conservation agriculture," he said.

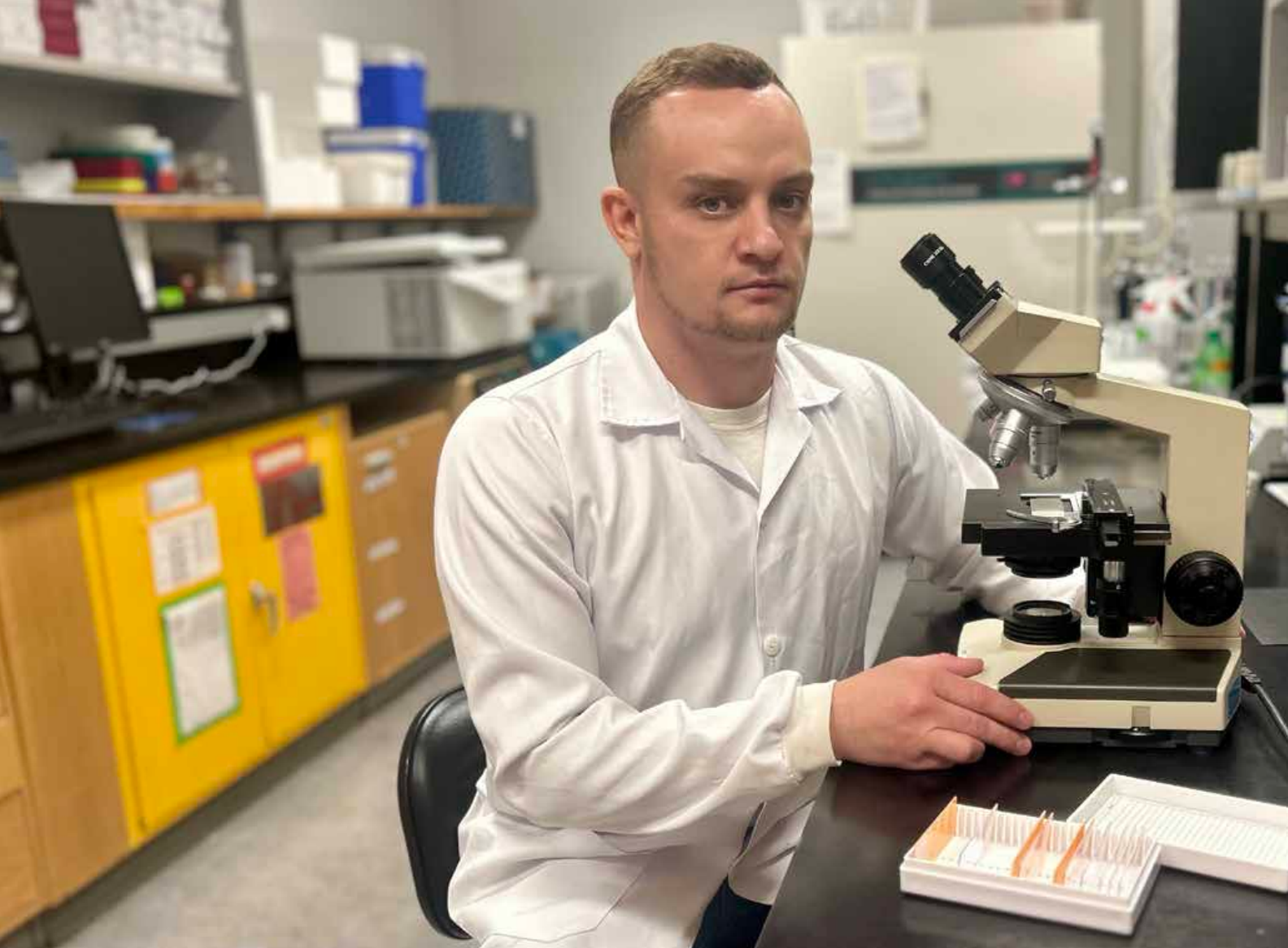
Having all this geospatial data of multiple layers at very high resolution allows researchers to model all sorts of processes, from crop yield to ecosystem processes and productivity, he added.

"We can use machine learning, which is a form of artificial intelligence, and take data from various areas of Western Canada and use that to train a model to predict on a much larger area. If we have a good enough data set, we can predict on all of Western Canada," Shirliffe said. "That's the kind of magic we're offering."

Bedard-Haughn said the Nutrien Centre for Sustainable and Digital Agriculture comes at a critical time in human history, when we need to think hard about global food security.

"This is not about creating the newest and greatest computers for the wealthiest farmers," she said. "This encompasses everything from how we work with satellite imagery to developing smartphone apps that can be used by small farmers in developing countries."

"We essentially need to do more with less. We're not creating more land, but we do have more people, we do have more mouths to feed, and we need to produce more food and do it in a way that is sustainable for our future." ■



Building better lentil varieties at USask

 IAN GOODWILLIE

USask graduate student Alex Silvestrini explores ways to build more resilient lentil varieties.

Canada's agricultural landscape is vast. Across the country, there are seemingly endless crops being grown in fields, orchards and beyond. Shimmering fields of wheat rocking in the breeze or vast ranges of canola that seem to glow in the sunlight are often among the first that come to mind.

Still, those are not the only stars of the Canadian agricultural show.

Lentils are now one of the country's most significant crops, where Canada has

become a world leader in their production to the tune of \$4.2 billion per year. However, this scale of success doesn't come without concerns.

Varieties grown in Canada can be vulnerable to several stressors due to limited genetic diversity. That's where research at places like the University of Saskatchewan's (USask) College of Agriculture and Bioresources comes in, diversifying those varieties and strengthening the world's food supply.



Alex Silvestrini
Photography by Kira Glasscock

Running back to Saskatoon

Originally from Lavras, Brazil, Silvestrini moved to Canada to pursue a PhD in Plant Sciences at USask. He was raised on a coffee farm that has been in his family for five generations, something that spurred his interest in studying agriculture on a deeper level.

Some might ask how a man who grew coffee in Brazil ended up researching lentils in Canada. According to Silvestrini, it makes perfect sense.

"I chose this project first due to my extensive background in plant genetics and the lack of genomics resources available for lentils, to which I consider I could contribute," he said.

Silvestrini holds a Bachelor of Science in Agronomy and a master's in genetics and plant breeding from the Federal University of Lavras, Brazil. Combine that with his

passion for agriculture and it's easy to see that Silvestrini is the right person for the job.

Leading the charge

Under the supervision of Dr. Kirstin Bett (PhD), Silvestrini's PhD work focuses on ways to build more resilient lentil varieties for the agricultural sector to grow and harvest. His research is part of a Genome Canada-funded project called *Enhancing the Value of Lentil Variation for Ecosystem Survival* (EVOLVES).

His specific contributions are in genome analysis. Part of that is comparing the genomes of the cultivated lentil and its six wild relatives in an effort to understand their differences and how they could work in combination for crop improvement.

The problem comes in the cross-breeding efforts, Silvestrini explained.

"One of the main issues that arises when trying to cross different lentils is related to chromosomal compatibility among them, first due to crossing different species and second due to the structural differences in their chromosomes, making the plant breeding process difficult."

To that end, he is trying to figure out why the chromosomes of these seven lentil species are less compatible and how to mitigate the issues when attempting cross-breeding.

The why of it all

If this seems like a massive undertaking, you'd be right, but his work is important to both lentil production and worldwide food stability. Silvestrini's research will play a huge role in helping plant breeders make informed decisions in developing new varieties. That could be a game-changer.

When asked about the impact of his research, Silvestrini said, "This will enhance crop resilience and productivity, leading to economic benefits for farmers and the broader agricultural sector. Beyond its practical applications, my results also advance fundamental scientific knowledge by offering new insights into genome evolution in plants."

And there has been progress.

"The scientific approaches used in my research are relatively new and unique within the Department of Plant Sciences and in the field of lentil genomics," he said. "The main outcome of this work will be a scientific manuscript presenting the first

genome assemblies for all seven lentil species—something already available for many other crops, but not yet for lentils."

A team effort

There's no doubt that years of education and research are paying off for Silvestrini. At the same time, he's the first to acknowledge this is a massive team effort from around the world.

Of course, he continues to work with the EVOLVES project. On top of that, he has several collaborators in Saskatoon at USask and the National Research Council. These efforts also stretch beyond borders into the United States, Europe, and Australia.

The Czech Republic, a well-known hub for plant genetics research, played a key role in his specific research. Silvestrini spent two months at the Czech Academy of Sciences working in the lab of Dr. Jiri Macas (PhD).

This trip, which was supported by the Robert B. and Norma McKercher Graduate Award for International Studies, led to a breakthrough discovery, "... identifying chromosomal regions, particularly centromeres, associated with major chromosome changes in lentils."

Research like this wouldn't be possible without funding sources. Silvestrini's work was generously supported by the EVOLVES project funded by Genome Canada and managed by Genome Prairie. Additionally, he received matching funding from the Saskatchewan Pulse Growers, the Western Grains Research Foundation, the Saskatchewan Ministry of Agriculture, and USask.

The future is bright

Silvestrini defended his PhD dissertation at the end of summer 2025. He intends to continue walking the research path and focus on genetics and genomics. There is certainly more to do in this field.

"Now that we have a better understanding of chromosomal changes across the different Lens species, the next step is to investigate what happens within each species," he said.

Silvestrini's work has developed tools and generated data that will assist in deeper tracking of issues present when planning crosses between lentil species. His goal is to bring greater stability to agricultural practices and improved food security for the world. ▀

The Saskatchewan Agriculture Graduates Association (SAGA) proudly represents the interests and accomplishments of graduates from the college and school.



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91st Annual SAGA Reunion Weekend – January 9 and 10, 2026

Our next reunion weekend and banquet is a celebration of 91 years of University of Saskatchewan (USask) agriculture grads gathering together. The reunion banquet will be held at the home of Saskatchewan agricultural history—the Saskatoon branch of the Western Development Museum (WDM).

Jan. 9, 4 – 7 pm: Friday Night Social at USask Agriculture Building Atrium, guided tours and Gabfest in ASA Lounge

Jan. 10, 7 am – 5:30 pm: SAGA Hockey Tournament in Waldheim

Jan. 10, 4 – 9 pm: Reunion: Banquet at WDM, followed by Mixer, 9 pm – 1 am

Recognition of years 1946, 1951, 1956, 1961, 1966, 1971, 1976, 1986, 1996, 2006, 2016 and 2021

Honorary life members for 2025

Kevin Hursh and Grant Devine were recognized as Honorary Life Members of SAGA at the 2025 Reunion Banquet.

Kevin Hursh '80 C graduated with distinction from the College of Agriculture in 1980, serving as Ag Student Association President and Senior Stick in his final year. Following graduation, he worked for 15 years doing farm news for CTV in Saskatchewan, establishing a weekly half hour show called Farmgate. Kevin and his wife Marlene run Hursh Consulting & Communications based in Saskatoon. Through the years, Kevin has served as executive director of the Inland Terminal Association of Canada (ITAC), the Canary Seed Development Commission of Saskatchewan and Sask Mustard. Kevin and Marlene managed communications for Crop Production Week for many years. The Hurshes also own and operate a farm near Cabri, growing a wide variety of

crops including chickpeas, large green lentils, maple peas, brown mustard and Canary seed. For more than 40 years, Kevin has written a weekly column, which for many years has been published in *The Western Producer*. He has also written for other farm publications and can often be heard on Saskatchewan radio stations. In 2021, Kevin received a Distinguished Agrologist Award from the Saskatchewan Institute of Agrologists. In 2023, Kevin was inducted into the Saskatchewan Agricultural Hall of Fame.

Donald Grant Devine '67 C was born in Regina and was raised on his grandfather's farm near Lake Valley. After earning his degree from the University of Saskatchewan, he completed his Master's in Agricultural Economics from the University of Alberta in 1970, before attaining his PhD in Agricultural Economics from Ohio State University in 1976. Grant taught agricultural marketing and consumer economics at the University of Saskatchewan from 1976-79. From 1982-91 he served as the Premier of Saskatchewan, while also holding the agriculture portfolio. While in these roles several agricultural policy initiatives were implemented such as reducing interest rates for farmers and homeowners, introducing the Net Income Stabilization Account and Gross Revenue Insurance Programs and creating Ag-West Bio Inc. the first biotechnology industry-government association in Canada. Grant was involved in the NAFTA negotiations between Canada, United States and Mexico and was a leading advocate for the fundraising to build the new Agriculture Building on the USask campus. He currently serves on the Land and Facilities and Finance and Investment committees of the Board of Governors at USask and has a farm and ranch near Moose Jaw.

2025 SAGA highlights

Terry Grajczyk '83 C is the president.

Ella Grimeau was recognized as the SAGA Scholarship recipient for 2024-25 at the 2025 Reunion Banquet.

The June 2025 SAGA newsletter (available online at saskaggrads.com and to members by email or by mail) contained class photos of the 2025 reunion, 90th anniversary

celebration.

The SAGA executive has approved the establishment of two new awards sponsored jointly by SAGA and the College of Agriculture and Bioresources.

Distinguished Graduate Award

This award is presented to graduates of agriculture programs at the University of Saskatchewan in recognition of significant achievement which contributes positively to society.

Distinguished Graduate Young Achievement Award

This award is presented to graduates of agriculture programs at the University of Saskatchewan who show promise of contributing significantly to society. Nominees must be 40 years of age or less at the time of nomination.

Information will be posted on the SAGA and college websites when details are finalized.

Stay in touch

If you're a SAGA member and have changed your contact information (email address, mailing address) – please reach out to us, to make sure we have your most up-to-date information:

SAGA membership
memberships@saskaggrads.com

General inquiries
contact@saskaggrads.com

SAGA reunion and chairperson
reunion@saskaggrads.com

SAGA treasurer
treasurer@saskaggrads.com

Submit news to The SAGA editors
newsletter@saskaggrads.com

Call for volunteers

SAGA is a volunteer-led organization dedicated to creating community for College of Agriculture and Bioresources graduates. Each year we need volunteers to be chairpersons to organize their classmates for the annual reunion. Are you interested?

SAGA invites all degree, diploma and certificate graduates of the College of Agriculture and Bioresources to join our alumni association, see saskaggrads.com for more information.



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