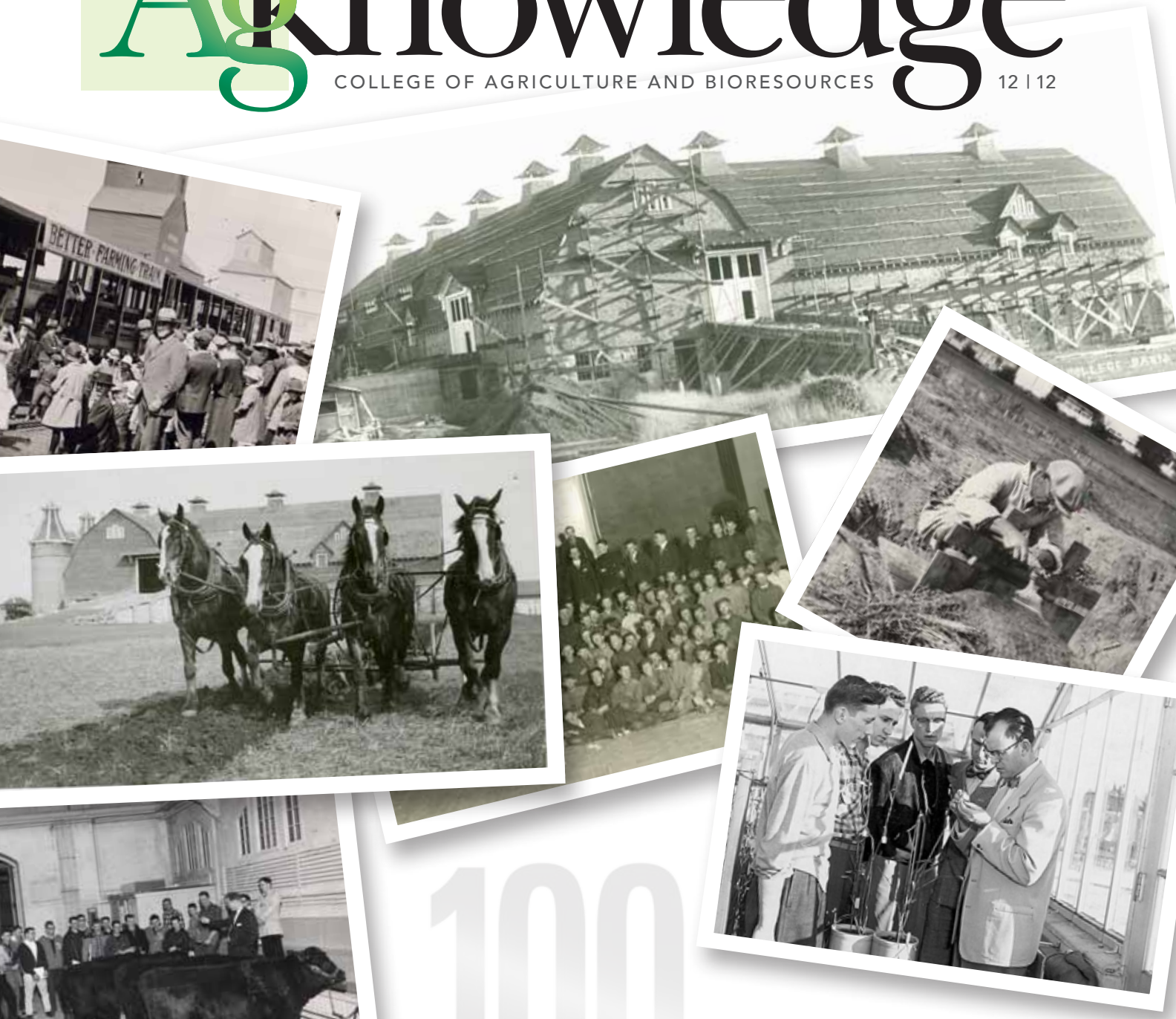
Agknowledge

COLLEGE OF AGRICULTURE AND BIORESOURCES 12 | 12



100

Celebrating 100 YEARS AGBIO

University of Saskatchewan
College of Agriculture and Bioresources

syngenta

The world needs more food. By 2050, there will be another 2 billion people on our planet. How do we provide enough high-quality food and preserve our environment? At Syngenta, we believe the answer lies in the boundless potential of plants. We develop new, higher yielding seeds and better ways to protect crops from insects, weeds and disease so farmers can get more from existing farmland and take less new land into cultivation. It's just one way in which we're helping growers around the world to meet the challenge of the future: to grow more from less. To find out more, please visit us at www.growmorefromless.com

Bringing plant potential to life

Inside this issue

On the cover: Photos from the University of Saskatchewan Archives

Celebrating 100 YEARS AGBIO

Agknowledge

Editor
Kira Glasscock, Communications Co-ordinator
College of Agriculture and Bioresources

Contributing Editor
Colleen Romuld, Director of Operations,
College of Agriculture and Bioresources

Writers
Glenn Cheater, High Bluff Media
Beverly Fast, freelance writer

Graphic Designer
Deanna Miller, Deanna Miller Design

Printer
Houghton Boston

Published by the College of Agriculture and Bioresources, University of Saskatchewan.

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

www.agbio.usask.ca

Publication Date
December 2012

College of Agriculture and Bioresources' 100th class of students.

Dean's Message

Welcome to *Agknowledge*.

This year has been an exciting year for the College of Agriculture and Bioresources as we celebrated the college's 100th anniversary!

We started the year with a kick-off and an all-years alumni reunion held at the beginning of January. At the kick-off event, the fully-ringed Senior Stick was retired into a display case and a new stick begun to carry on the tradition.

In June we hosted an open house complete with tours of facilities and department displays. Over 500 faculty and staff, alumni, industry partners and community members came out, and learnt about who we are and what we have become over the last 100 years.

Centennial celebrations continued in September with a barbeque hosted by the Saskatchewan Institute of Agrologists, complete with cake, to celebrate with the students.

September was a great month as we welcomed the 100th class of students and it is one of the largest first-year classes we have had! This is exciting to see as students are the ones who will carry on a wealth of knowledge that the world so desperately needs to make a reasonable future for itself.

For 100 years, faculty, staff and students have been contributing to a better world. The centennial has given us the opportunity to highlight what the college has accomplished. When you look at how much the college has changed over the past 100 years, you recognize that it will probably have to change an equivalent amount in the next 100 years. With issues like a global need for food security and climate change, the college and our students will have much to contribute.

Other exciting news at the college includes the construction of the Rayner Dairy Research and Teaching Facility, which is scheduled to be completed spring 2013. As always, the college continues to grow and evolve to stay current, produce world-class research and provide an exceptional educational experience for our students.

In this issue of *Agknowledge* you will see some of our past and how we are driving into the future. Compare milestones of the college's last 100 years to today's classroom technology and unique learning opportunities, and some amazing research innovations. Enjoy the taste of how we Agros, working together, will help all aspects of agriculture evolve to meet tomorrow's needs.

Sincerely,
Dean Mary Buhr

Faculty Renewal

WELCOMING NEW FACULTY TO THE COLLEGE

NATACHA HOGAN

Animal and Poultry Science and Toxicology Centre

Academic Background: BSc (Biology), University of Prince Edward Island, 1999; PhD (Spec. Chemical and Environmental Toxicology), University of Ottawa, 2006.

Focus of Work: Effects of synthetic and natural toxicants on animal health with focus on how nutritional, hormonal and immunologic factors influence susceptibility to toxicant-induced damage, particularly during development.

Passion: Making connections between changes at the cellular level and implications for animal health and disease. Most of my research takes a molecule-to-organism approach where mechanisms underlying toxicity are used as early indicators of exposure. The intent is to use this information to help us better predict the risk that toxicants (present in water or feed materials) pose to animal health and develop intervention strategies.

SINA ADL

Soil Science

Academic Background: BSc, University of British Columbia, 1991; MSc, University of British Columbia, 1993; PhD, University of British Columbia, 1998; Postdoctoral Scholar, Paris-XI, 1998-1999; Postdoctoral Scholar, University of Georgia Institute of Ecology, 1999-2001.

Focus of work: To understand the interactions among soil organisms that are responsible for the decomposition of organic matter and the mineralization of nutrients into the soil solution.

Passion: I became fascinated by the microscopic world early in my university education. These species contain most of the planet's biodiversity and are responsible for most of its biogeochemistry. Understanding their role in the soil is critical for the sustainable management of our agricultural and forestry resources.

SUPRATIM GHOSH

Food and Bioproduct Sciences

Academic Background: BSc (Chemistry), University of Calcutta, India, 1996; BTech (Chemical Technology), University of Calcutta, India, 1999; PhD (Food Science), Pennsylvania State University, USA, 2007; Postdoc, Ryerson University, Toronto, 2007-2011.

Focus of Work: To improve bioavailability of health-promoting bioactive ingredients in food. I seek to understand how the physicochemical functionality of molecules at the nano- and micro-scales can be controlled to improve macroscopic properties of food (e.g., texture, shelf life) and its overall healthfulness.

Passion: The driving force behind my research philosophy is to improve the quality of human life through the development of novel bio-based materials for enhanced food quality and functionality. I also want to raise awareness through my teaching so that the students can think critically and be passionate about the importance of food science in society.

Unseen Menace

THEY'RE RARELY SEEN, BUT FERAL WILD BOARS ARE A MAJOR THREAT TO SASKATCHEWAN'S FARMS AND PARKLANDS

By Glenn Cheater

Ryan Brook gets a lot of blank looks when he tries to warn people about the threat of feral wild boars in Saskatchewan.

"Many people in the province simply don't believe we have a problem with feral wild boars," says Brook, an assistant professor in the Department of Animal and Poultry Science.

"You often hear people say they would never be able to survive Saskatchewan winters in the wild. But they are doing very, very well in this province."

In this case, 'very well' is very bad. Just ask a farmer or naturalist in Texas, home to about half of the four million feral wild boars in the U.S.

"Feral wild boars are a massive problem in Texas, California, and many other states," says Brook. "In Texas alone, the damage to agricultural crops is $50 million a year. That doesn't count the $7 million they spend trying to control their numbers or the ecological damage. They're a rooting animal, and people say when they get into wetlands, it looks as if a giant rototiller has gone through the landscape. One estimate of the over-all damage in the U.S. is $1.5 billion a year."

Those are serious numbers and if the giant rototiller description seems exaggerated, type in 'wild boars damage' into Google images and see for yourself. But Brook has another picture that people in this province should find especially chilling.

"One of our trail cameras northeast of Saskatoon got a picture of a female with four young boars, only a few months old, trailing behind her, followed by a group of almost newborn piglets," says Brook. "It appears that female has had two litters in a year, which shows the kind of reproductive output wild boars can achieve."

Brook isn't trying to be alarmist, but says it's time to recognize wild boars are already a problem in some parts of the province, and things are likely to worsen.

"If you talk to people in Texas and California, they'd probably tell you there's only a small window where with extreme effort, you might be able to eradicate them," he says. "Texas has over two million feral wild boars and the potential for extreme numbers in our province is very, very high."

Wild boars, native to Europe and much of Asia, were introduced to North America by Spanish explorers in the 17th century. They came north in the 1970s and 1980s when the first commercial domesticated wild boar farms were set up. Escapees had no problem adapting to their new northern home, and this remains an issue – although Brook notes there is a significant market for domestic wild boar meat and the key is to ensure farms employ rigorous containment strategies.

Although there's been nothing found here to rival 'Hogzilla' —a 450-kilogram, 3.7-metre-long tusked monster caught in Georgia in 2004—males here typically weigh 90 kilograms and can grow to twice that size. They prefer dense brush and wetlands, the kind of landscape you find in Moose Mountain Provincial Park, where local farmers have been waging a little-reported war on them for years.

"They've had some successes in Moose Mountain trying to eradicate local populations, but despite that, the numbers in the province keep growing," says Brook. "In the last five years, there have been sightings across the province from Prince Albert and the tree line in the north all the way to the U.S. border. But we don't really have a handle on how many there are."

There's a good reason for that. Despite their size and the damage they can cause—one farmer next to Moose Mountain park lost 15 acres of oats to wild boars in just two days—these highly intelligent animals are amazingly elusive. They are most active in the evening and early morning, and use their keen sense of smell to both search for food and avoid any humans.

"MILLIONS OF FERAL WILD BOARS CAUSE MASSIVE DAMAGE TO CROPS AND THE ENVIRONMENT SOUTH OF THE BORDER AND THEY'RE BECOMING ESTABLISHED IN SASKATCHEWAN."

But those who have had chance encounters with wild boars never forget them.

"I talked to a fellow from Aberdeen (a half-hour drive northwest of Saskatoon) who was taking away a grain pile with an auger this summer when all of a sudden this great big boar emerged

▲ An example of the type of damage a group of feral wild boars can do within hours.

from the pile," says Brook. "He had been living in the pile and had eaten a huge amount of grain."

There's little data on these sorts of incidents—crop insurance only set up a separate category for wild boar damage last year—and Brook says he suspects such cases are relatively rare so far. But for how long?

"Obviously the first step is to know how many you have and where they are," says Brook.

Brook has obtained some funding from the Cyril Capling Trust Fund, NSERC, and the University of Saskatchewan for a limited investigation. The picture of the female with her bountiful brood came from a project using "black flash" trail cameras, which employ infra-red light invisible to mammalian eyes. (Wildlife avoid spots on their regular trails if surprised by a flash from a normal camera.) Cameras were set up in 17 locations around the province this spring, and while the research provides insights in boar populations and behaviour at these sites, it truly is just a snapshot of what's going on.

A far greater effort is needed, says Brook.

"The key thing is getting the right people at the table and launching a coordinated effort between many groups," he says. "You also need the will to do something. When you're dealing with an animal that reproduces at this rate, a go-slow approach is not going to have any benefit."

Brook, a Manitoba native, says he was "astounded" to find so few people in the province realized the potential threat posed by wild boars when he joined the College of Agriculture and Bioresources in 2010.

"When you look at the crop losses, disease potential (wild boars can carry many viral or bacterial diseases and a host of parasites), the environmental damage, and the rest, this critter could conceivably become the biggest species of concern in our province."

In the U.S., 'razorbacks' are now an established part of the rural environment and no one talks of eradication any more. That doesn't have to be the case here, says Brook.

"I dearly hope that we don't reach a point in our province where we have hundreds of thousands of wild boars causing tens of millions of dollars in damage each year." ■

STUDENT SPOTLIGHT

Big-picture View

PERSPECTIVE IS JUST AS IMPORTANT AS SCIENCE IN THE RENEWABLE RESOURCE MANAGEMENT PROGRAM

By Glenn Cheater, Photo by Dave Stobbe

Saving the environment and playing hockey are pretty different things, but they hold one important similarity for Page Beaton, former Huskies defender and member of the first class of the Renewable Resource Management degree program.

"I'm a tall girl and when I'm on skates, I'm over six feet—so I can stand on the blue line and I can see the whole ice," says the 22-year-old.

"That's really a goal of my studies. To be able to see all these different sides and appreciate what's happening in the bigger picture."

Gaining a perspective—and the expertise to evaluate what you're seeing—is at the heart of the Renewable Resource Management program, which covers everything from the basic science of soil and plants to putting together a start-to-finish environmental plan. The program also emphasizes field work—something that appealed to Beaton (although it would eventually mean she no longer had time for hockey).

"I love hands-on learning and when I heard about this new program they were creating, I thought it sounded pretty interesting," says the Saskatoon native.

"It was funny, though. When I showed my letter of acceptance to my parents, my dad laughed and said, 'That must be a typo. It says you're in the College of Agriculture and Bioresources.'"

Beaton passed up a hockey scholarship from the University of Chicago to join the inaugural class in September 2008. She says she was inspired by the enthusiasm of soil science professor Dan Pennock, who led the effort to establish the degree program.

"In the first year, there were only about five of us, so it was a really small program," says Beaton. "In the first two years, you take your basic science courses and a bit of economics, but in the third year you get to do your field course. There was a week working in the boreal forest at Emma Lake Kenderdine Campus, another week in the grasslands by Lake Diefenbaker, and several weeks doing a plant and soil mapping project at One Arrow First Nation near Prince Albert."

By her fourth year, enrolment had grown to more than two dozen and Beaton was part of a group of seven students who undertook a cost-benefit analysis of a Ducks Unlimited Canada wetlands restoration in the upper Qu'Appelle watershed. By year's end, she will have finished all of her required courses and will complete her degree by taking a minor in communications at Curtin University in Perth, the centre of Western Australia's massive mining boom.

It's another part of the world where there's a gulf between those who extract natural resources and environmentalists who decry their methods—and where there's a need for bridge-building.

"You need to have someone who can help the two sides understand each other," she says. "There are all these different aspects and it's not easy to tie them altogether. The further I've gone in my studies, the harder it is to put it into simple terms of one side is right and the other is wrong."

> "THERE'S A GULF BETWEEN THOSE WHO EXTRACT NATURAL RESOURCES AND ENVIRONMENTALISTS WHO DECRY THEIR METHODS—AND WHERE THERE'S A NEED FOR BRIDGE-BUILDING."

The Renewable Resource Management program—created partly in response to industry calls for resource-management expertise—is itself a sign of how things are changing, she says. While resource companies may have once viewed environmental reviews as something to be gotten around, Beaton says they now recognize sound stewardship as a core practice.

"If you try to fake it, get your permits and then not follow through on your promises, you're going to run into huge and expensive legal issues, and have lots of groups coming after you," Beaton says. "Companies know there will be repercussions."

That's raised the environmental bar for resource extraction, and Beaton predicts graduates of her program will be in high demand.

"It's a great program and I've seen how applicable the learning is," says Beaton. "Once the word gets out there, this program is going to skyrocket."

Students using clickers in class.

Click On This

FORGET SITTING BACK AND PASSIVELY WATCHING A SCREEN – KRISTA WILDE AND MURRAY DREW ARE USING TECHNOLOGY TO ENGAGE STUDENTS IN NEW WAYS

By Glenn Cheater, Photo by Krista Wilde

Krista Wilde knows the classroom from back to front.

"As an undergrad, I often sat at the back of the lecture hall and there would be students sleeping," says Wilde, now a lecturer in the Department of Plant Sciences. "But today you just don't see that very often."

Wilde hasn't found a magical potion to keep her students from nodding off even though, she admits, some material in courses like Statistical Methods "can be pretty dry."

So what's changed? In a word, 'clickers.' The slimmed-down remotes with a dozen or so buttons, (generally labelled 1/A, 2/B, etc.) were first introduced at the University of Saskatchewan in 2007 and today about 11,000 students on campus are registered users.

It's a simple but powerful tool for engaging students—and keeping them alert. For example, consider a lecture on probability theory. While detailing such things as stochastic processes and mathematical abstractions of non-deterministic events, Wilde may throw out this question (and several possible answers):

Your friend is playing a game in which he wins $5 every time he flips a coin and it turns up heads. He has flipped tails 36 times in a row. What are the odds that in the next three tosses of the coin, heads will come up once?

Immediately, students are punching in their choice and eagerly awaiting the results of 'the vote' and the correct answer (bottom of page).

"In big classes, what generally used to happen was the professor stood at the front and talked, and the students sat and took notes," says Wilde. "You just didn't get a lot of interaction. But with clickers, students get to participate and give an opinion."

Of course, professors can always keep students on their toes by—horror of horrors—randomly singling them out and asking a question. Clickers are a better alternative, says Wilde.

"It's fun and if we're doing, say, a review in preparation for a mid-term, they can do a self-test and it's low stakes," she says. "Clicking is anonymous, but I always tell my students they shouldn't feel bad if they get the wrong answer or think that they're dumb. These are just questions they can take home and think about when they're studying course material."

This is another thing Wilde learned in her undergrad days. Although she grew up in the small farming community of Rosthern, Sask., she didn't know much about agriculture and was nervous when she began taking classes at the College of Agriculture and Bioresources. She feared she would be singled out on that score, and today is still grateful for the warm welcome she received from her professors and classmates. She wants to do the same for her students, even though that's not easy in classes of 200-plus.

"Using clickers makes students aware that you want to engage with them," says Wilde. "I now get a lot more students coming up to me after class. Usually it's about clicker questions, but they also tell me about themselves and their interests. Clickers definitely open the door."

Murray Drew agrees on-the-spot questioning is "kind of hard on some students." But he does it just the same.

"I just hate it when students just sit there and don't participate," says the associate dean, and animal and poultry science professor. "So I usually spend the first 10 minutes of a lecture going around the room, asking questions and putting them on the hot seat."

But Drew has also been seeking a better way to engage students and that's why—after 12 years of giving traditional lectures—he's adopted video technology and a new form of teaching called 'flipping the classroom.' This summer, Drew used low-cost, screen-capture software to put onto video the PowerPoint slides he uses in his third- and fourth-year animal nutrition and science courses. He does a voice-over for the slides, videotapes himself giving opening and closing remarks, and posts them on YouTube (the videos are 'unlisted' – which means you need a link to find them).

"The reason I used YouTube is you can watch them on pretty much any device, including a smartphone," says Drew. "So a student could watch them while coming to university on the bus."

That's right. The kid sitting next to you could be learning about bacteria levels in the gastrointestinal tract of pigs and how to measure ileal digestibility (a measure of amino acid bio-availability) in its feed. But it gets stranger still.

"My normal lecture is about 50 minutes," says Drew. "But I'll compress it to about 20 minutes because I think that's about as long as anyone could stand to watch a video of PowerPoint slides with a voiceover."

Obviously that means leaving out a fair chunk of material. But the goal isn't to make classes less informative, or easier to skip. It's when you get to class that you discover it's called flipping the classroom because it turns the traditional 'listen to lecture, then study at home' pattern upside down.

"Because they've watched the lecture before they get to class, I can then do things such as give them problem sets and group work so they can use the information in the lecture and actually apply it," says Drew.

This is where old meets new. 'Problem-based learning' was developed a half a century ago, but the challenge has always been how to deliver the lecture material and still have time for students to develop their problem-solving skills in the classroom.

That's why YouTube lectures and clickers are neither trendy gizmos nor pandering to a generation that's so constantly plugged in they've been dubbed Gen S (Generation Screen). Both professors say technology is just a tool and, like all tools, the benefits come from how you use them.

"Let's just admit that the way people work and learn has completely changed," adds Drew. "I keep coming back to this: I don't want passive learners because one day they'll be going out into the workforce and they won't be allowed to be passive. They're going to be expected to be able to take information and put it into forms that people can use." ■

COIN-FLIPPING ANSWER: To calculate this probability, list all possible heads/tails outcomes: HHH, HTH, HHT, and so on. There are eight combinations, but only three when heads come up just once. Therefore the odds are 3/8 or 37.5 per cent.)

Bachelor of Science

Animal Bioscience

The Bachelor of Science in Animal Bioscience four-year program provides students with a broad background in domestic animal biology. This program meets Pre-Veterinary Medicine requirements and prepares students to work in fields outside of traditional animal agriculture including biomedical sciences, companion, equine and research animal care, animal health and environmental sciences.

The program is designed to prepare students for diverse career choices in government, non-government organizations and the private sector including:

- Animal pharmaceutical sales and clinical trial testing
- Environmental impact assessment of wild and domestic animal interactions
- Laboratory testing and development of DNA tests for animal traits related to health and performance
- Animal welfare positions within and outside government, such as the SPCA, cities and rural municipalities
- Product development and sales for the growing pet care industry
- Research animal care and management

For more information or to apply:
agbio.usask.ca/animalbioscience

University of Saskatchewan
College of Agriculture and Bioresources

Student Excellence

ENTRANCE AWARDS

AGBIO Renewable Entrance Scholarships
Benjamin Dietrich, Moosomin
Logan Pizzey, Biscarth MB
Sarah Wist, Central Butte
Jasmine Tenkink, Prince Albert
Brianna Zoerb, Delisle
Silas Friesen, Waldheim

AGBIO Entrance Scholarships
Dallis Aiken, Canwood
Niki Beingessner, Truax
Megan Bergsveinson, Alameda
Danielle Black, Fort Qu'Appelle
Lane Blanke, Swift Current
Charlotte Corbett, Bruno
Erin Davis, Warman
Erika Dowling, Prince Albert
Timothy Fiss, Qu'Appelle
Taryn Heidecker, Middle Lake
Jessa Hughes, Eston
Shelby LaRose, Kipling
Shawna Lajoie, Sylvania
Cassidy Oborowsky, Grandora
Katelyn Rath, Saskatoon
Shelby Riche, Bethune
Mathew Scott, Cupar
Courtney Trudeau, Wymark
Jaden Wood-Sparrow, Vanscoy
Amanda Wuchner, Humboldt

Arnold and Emily Robinson Scholarship
Emilie Viczko, Lake Lenore

Beatrice Murray Entrance Scholarship
Shannon Walker, Langham

Canadian Wheat Board Scholarship for Diploma in Agriculture
Jennifer Davidson, Milestone

Douglas Christie Ferguson Fund Scholarship
Sarah Barnsley, Saskatoon
Ann Kusler, Maple Creek
Christine Mysyk, Saskatoon

Jim Anderson Scholarship in Agriculture
Garth Stang, Macklin
Daniel Roelens, Canora
Christopher Diederichs, Cudworth
Michelle Hildebrand, Boissevain MB

Robert and Maude Hale
Delaney Murphy, Saskatoon

Saskatchewan Chicken Industry Development Fund Award in Agriculture
Megan Hodges, Dalmeny

CONTINUING STUDENT AWARDS

AGBIO Renewable Entrance Scholarships, Second Year
Tracy Fehr, Rosthern
Sarah Johnson, Churchbridge
Shannon Palmer, Port Alberni BC
Moira Petruic, Avonlea
Lukas Smith, Radisson

AGBIO Renewable Entrance Scholarships, Third Year
Melanie Hawrysh, Borden
Kathryn Stolle, Christopher Lake
Steven Tetreault, Leoville

AGBIO Renewable Entrance Scholarships, Fourth Year
Kaitlyn Schurmann, Abbottsford BC
Blake Weiseth, Shaunavon

AGBIO Renewable Transfer Scholarships, Fourth Year
Ruth Kost, Saskatoon

Adeline and William Haberman Memorial Scholarship
Steven Tetreault, Leoville

Albert and Beatrice Trew Memorial Scholarship
Kerrie Andreas, Sheho
Jesse Bond, Marengo

BASF Canada Scholarship in Plant Sciences
Kerrie Andreas, Sheho
Jesse Bond, Marengo

Bayer Crop Science: InVigor Canola Scholarship
Ian Epp, Blaine Lake
Kerrie Andreas, Sheho

Bert Hargrave Scholarship
Danica Lucyshyn, Saskatoon

Bert Salloum Scholarship in Agriculture Economics
Andrea De Roo, Fairlight

Canadian Prairie Lily Society John Bond Scholarship
Lisa Taylor, Saskatoon

Canadian Prairie Lily Society T.A. (Andy) Dingwall Scholarship
Justin Stokes, Moose Jaw

Canadian Society of Animal Science Book Prize
Lisa Johnson, Churchbridge

Carlson Scholarship in Renewable Resource Management
Kaitlyn Kelly, Swift Current

Charles C. Cook Student Leadership Award
Jillian Panchuk, Saskatoon
Mark Sigouin, Zenon Park

David J. Welch Memorial Prize
Jason Fleischhacker, Fulda

Dow Agrosciences Scholarship in Agriculture
Jillian Panchuk, Saskatoon
Kirstie Rissling, Denzil

Elaine Partington Equine Thesis Award
Katherine Schutzman, Regina

- **Elmer Laird Memorial Scholarship for Organic Agriculture**
  Cody Northam, Rapid City MB

- **Ernest Winn McKenzie Scholarship**
  Mark Sigouin, Saskatoon

- **Ewald M. & Donna I. Kitsch Scholarship in Crop Science**
  Mallory Erickson, Tulliby Lake AB

- **FCC Business Planning Award 1st Place**
  Conrad Nagel, Mossbank
  Jillian Heatcoat, Assiniboia
  Shaun Vey, Saskatoon
  Travis Brisebois, Kincaid

- **FCC Business Planning Award 2nd Place**
  Christine Young, Yorkton
  Jennifer Jelinski, Saskatoon
  Allyson Mierau, Langham
  Ashley Greiner, Yorkton

- **FCC Business Planning Award 3rd Place**
  Roger Hounjet, Saskatoon
  Rebecca Bidwell, Saskatoon
  Jeremy Doerksen, Garrick

- **FCC Business Planning Award 4th Place**
  Lexie Cook, Russell MB
  Jayden Balfour, Climax
  Vicky Anderson, Rosedale BC
  Jordan Wolkowski, Saskatoon

- **F.J. Fear Scholarship in Soil Science**
  Blake Weiseth, Shaunavon

- **Frank and Freda Riecken Scholarship in Soil Science**
  Dana-Rose Keeler, Turner Valley AB

- **Gillian Hughes Memorial Travel Fellowship**
  Steven Tetreault, Leoville

- **Harvey Scholarship**
  Mark Sigouin, Zenon Park
  Mallory Erickson, Tulliby Lake AB
  Alexis Tindall, Saskatoon
  Vangelis Karamanos, Calgary AB
  Ashley Pilon, Hudson Bay
  Lindsay Jensen, Saskatoon
  Ian Epp, Blaine Lake

- **Howard Lindberg Memorial Award**
  Jason Fleischhacker, Fulda

- **James Donald Hardin Scholarship**
  Shawn Cowie, Rowatt
  Rodney Cowie, Rowatt
  Raelyn Wutzke, Aberdeen

- **Jickling Agricultural Scholarship**
  Jessica Weber, Landis

- **John Mitchell Memorial Scholarship**
  Alexis Tindall, Saskatoon

- **Kelly Aulie Memorial Scholarship**
  Alicia Sopatyk, Meacham

- **Larry Janzen Memorial Scholarship**
  Alicia Merriam, Saskatoon

- **Molson Canada Book Prize**
  Erin Hopkins, Saskatoon
  Yun Wang, Saskatoon

- **Pat Toderian Scholarship**
  Lisa Johnson, Churchbridge
  Marissa Wilford, Winnipeg MB

- **Port Metro Vancouver Scholarship**
  Blake Weiseth, Shaunavon

- **R.K. Baker Prize for Excellence in Poultry Science**
  Erin Cuthbert, Ladysmith BC

- **Robert and Maude Hale Scholarship**
  Danica Lucyshyn, Saskatoon

- **Rossnagel Scholarship for Academic Improvement**
  Natalie Blain, Prince Albert

- **Russell Fisher Scholarship**
  Christine Young, Bredenbury

- **Saskatchewan Institute of Agrologists Scholarship**
  Cordell Young, Bredenbury
  Jason Fleischhacker, Fulda
  Steven Tetreault, Leoville
  Kaitlyn Schurmann, Abbotsford BC

- **SaskMilk Undergraduate Scholarship**
  Danielle Saelman, Abbotsford BC

- **SaskPower Shand Greenhouse Education Prize**
  Derek Morris, Melville

- **Syngenta Achievement Award**
  Vangelis Karamanos, Calgary AB

- **University of Saskatchewan Scholarships**
  Nicole Marleau, Saskatoon
  Brendan Kessel, Balgonie
  Jordan Gottinger, Neudorf
  Ruth Kost, Saskatoon

- **University Undergraduate Scholarship**
  Kaitlyn Schurmann, Abbotsford BC
  Tracy Fehr, Rosthern
  Kaitlyn Kelly, Swift Current
  Zachary Kurtenbach, Deloraine MB
  Amanda Gabruch, Consul
  Rebekah Esau, Saskatoon
  Lisa Johnson, Churchbridge
  Danielle Schindelka, Raymore
  Andrea De Roo, Fairlight

- **W.J. Copeland Scholarship in Crop Science**
  Dustin McLaren, Moose Jaw

- **William G. Barclay Scholarship**
  Jane Johnston, Swift Current

GRADUATION AWARDS

- **The Fulton Family and Saskatchewan Institute of Agrologists Award**
  Tess Strand, Preeceville

- **Norman H. Horace Pearce Prize in Animal and Poultry Science**
  Angela Japp, Eston
  Alex Neumann, Saskatoon
  Alyssa Krone, Saskatoon

- **Molson Canada Award of Excellence**
  Jae Hee Jennifer Kim, Toronto

- **P.M. and Y.Y. Huang Distinguished Award in Soil Science**
  Janell Healey, Prince Albert

- **Saskatchewan Horticulture Association Prize**
  Carmen Danyluk, Kamsack

- **Saskatchewan Institute of Agrologists Gold Medal**
  Kendra Purton, Yorkton

- **Frank Sosulski Graduation Prize in Plant Sciences**
  Lindsay Griffith, Bangor

- **William Allen Memorial Prize in Agriculture Economics**
  Shaun Vey, Wakaw

POSTGRADUATE AWARDS

- **Ajinomoto Heartland/ Halchemix Scholarship**
  Rohini Agivale

- **Alexander and Jean Auckland Postgraduate Award**
  Jenalee Mischkolz

- **Barbara and Frank Pavelich Postgraduate Scholarship**
  Phillip Garvey

- **C. Paul W. and Marianne M. Ziehlke Postgraduate Award**
  Aron Cory
  Tyler Schwaiger

- **Canadian Dairy Commission Scholarship**
  Shelicia Forbes-Brown
  Ricky Lam

- **Canadian Wheat Board Graduate Fellowship**
  Kirby Nilsen
  Xiaoyu Liu
  Marija Pavleska
  Katarzyna Bolek
  Mohammad Torshizi

- **Class of '43 60th Anniversary Award**
  Hasan Pervej Ahmed

- **Dollie Hantelman Postgraduate Scholarship**
  Candace Piper

- **Dr. Robert E. Redmann Memorial Graduate Scholarship in Plant Sciences**
  Yusef Abu

- **Elmer Laird Memorial Scholarship for Organic Agriculture Postgraduate Award**
  Angelena Syrovy

- **F. V. MacHardy Graduate Fellowship in Grasslands Management**
  Lei Ren

- **Harris and Lauretta and Raymond Earl Parr Memorial Scholarship in Agriculture**
  Melissa Arcand
  Dilshan De Silva Benaragama
  Molly Patterson
  Colleen Redlick

- **John Baerg Award**
  Larissa Jancewicz

- **John Blake Memorial Postgraduate Scholarship**
  Da Wang

- **John Wickhorst Memorial Scholarship**
  Candace Piper

- **Kathleen and Norman Lean Postgraduate Scholarship**
  Kaitlin Strobbe

- **L.H. Hantelman Postgraduate Scholarship**
  Ke Feng
  Kirby Nilsen

- **Martin Pedersen and Family Postgraduate Scholarship**
  Courtney Phillips

- **Maurice Hanson Sr. Postgraduate Award**
  Courtney Phillips

- **Molson Canada Post Secondary Excellence Award**
  Vinti Kumari

- **O.M. Elviss Postgraduate Scholarship**
  Hussien Mohammed Beshir

- **Paulden F. and Dorathea I. Knowles Postgraduate Scholarship**
  Aron Cory
  Manu Gangola
  Ketema Abdi
  Kayla Lindenback

- **Purdy Postgraduate Scholarship**
  Min Li

- **Putnam Family Memorial Award**
  Kendra Purton

- **Rene Vandeveld Postgraduate Scholarship in Crop Science**
  Ehsan Sari
  Douha Kthiri
  Hussein Mohammed Bashir
  Mahla Mirali
  Jun Liu

- **Roderick Alan McLean Memorial Award**
  Rajib Podder

- **R.P. Knowles Scholarship**
  Eric Gerbrandt

- **S.N. Horner Postgraduate Scholarship**
  Henry Wai Chau
  Elliot Hildebrand
  Hannah Konschuh
  Mike Lavender

- **Saskatchewan Pulse Crop Development Board Dr. Alfred E. Slinkard Scholarship**
  Nicole Avramenko

- **Saskatchewan Pulse Crop Development Board Don Jaques Memorial Fellowship**
  Angelina Syrovy

- **Saskatchewan Institute of Agrologists Scholarship**
  Elliot Hildebrand

- **SaskMilk Graduate Scholarship**
  Matt Walpole

- **Syngenta Scholarship in Sustainable Agriculture**
  Lisa Malo

Achtung Gen-food!

WHEN GM CONTAMINATION COST PRAIRIE FLAX GROWERS THEIR KEY EUROPEAN MARKET, U OF S PLANT BREEDERS UNDERTOOK AN UNPRECEDENTED EFFORT TO PURIFY THEIR BREEDING LINES

By Glenn Cheater, Photos by Dave Stobbe

Helen Booker

If you want to know how fast the world changes, ask a flax grower.

In summer 2009, European officials tested two cargoes of Canadian flax seed and discovered genetically modified material. Even before the German chapter of Greenpeace could hold media events—waving 'Achtung Gen-food!' signs in grocery stores—it was game over.

At the time, Europe bought about 70 per cent of the 800,000 tonnes grown on the Prairies each year. Orders plunged, and so did prices, falling by one-third in a matter of weeks.

Everyone was stunned. After all, the only GM flax, unfortunately called Triffid (a name popularized by a 1950s sci-fi novel about genetically engineered, man-eating plants) had only been grown in small quantities for seed production in the 1990s, was never sold for commercial production, and was believed to have long since been purged from the system.

But to be on the safe side, the Crop Development Centre tested the seed of its breeder's lines.

"We tested to the 0.1 per cent level for presence of Triffid DNA in the breeders' seed and they didn't find anything," recalls flax breeder and assistant professor Helen Booker.

"By Christmas, labs were able to test to the 0.01 per cent level and in January 2010, we sent the breeders' seeds for further testing and that's when—how do I put it?—the bacon hit the frying pan."

Others would use much stronger language when they heard the disastrous news. CDC varieties accounted for 87 per cent of seeded flax acreage on the Prairies, home to nearly half the world's flax production. With super-sensitive testing —one seed in 60,000 was all it took—Triffid was turning up everywhere. It was only trace amounts, but that was irrelevant, says Booker.

"In the end, the quantity doesn't really matter—zero means zero," she says.

Stuffing the genie back in the bottle would require a massive and unprecedented effort, involving Booker and her team, SeCan (the country's largest supplier of certified seed), and seed growers both here and in New Zealand.

It's a tale with a loaves-and-fishes element: Archival samples of two leading varieties (CDC Bethune and CDC Sorrel) and two new ones (CDC Sanctuary and CDC Glas) were chosen to be 'reconstituted.' The task was to turn this tiny amount of seed into enough to sow 1.5 million acres, the pre-Triffid acreage, by 2014. That's roughly four trillion seeds.

And to regain the European market (exports are still down more than 90 per cent), not one of those four trillion seeds could be genetically modified. Not only would the archival samples have to be purged of any GM contamination, but there would have to be rigorous and extensive testing at every stage as the breeder's lines were multiplied. No chances could be taken.

In order to meet their 2014 deadline, the new purified lines would be multiplied during the Canadian winter in New Zealand (where no GM flax had ever been grown), and then handed over to a carefully chosen seed grower near Delisle, southwest of Saskatoon, come spring.

"It was a century farm and he had never grown flax before," notes Booker. "As well, he didn't allow people on his farm or use custom contractors. It was as clean a site as could be found in Saskatchewan."

The initial testing on plants grown in CDC's plant chambers in the summer of 2010 was conducted by a private Saskatoon lab, Quantum Biosciences. But given the number of tests required, the centre needed its own facility.

Lester Young, a former U of S post-doctoral fellow, was hired to set up the testing facility in the new genotyping lab on campus. Equipped with a new real-time PCR machine (which amplifies and detects DNA), Young was responsible for ramping up testing to unheard-of levels. The test requires germinating seeds and testing their DNA. Prior to this crisis, 24 tissue tests were once considered a full day's work, but this was no longer nearly enough.

"We wanted to look at all the different lines that had gone through our nursery so we could say we'd tested everything and that any new varieties registered by CDC were free of Triffid," says Young. "That meant testing thousands of lines." In this case, a line means a single progeny row consisting of about 200 plants. In 2011, three single plants were selected from each progeny row for multiplying and two seeds from each of those plants were germinated and their tissue tested for the presence of the Triffid genetic marker. In 2012, 10 seeds were taken from each single plant selection, and their DNA extracted and tested.

In short, Young was one busy guy.

"In 2011, we tested about 11,000 lines and this year, we looked at close to 16,000 lines," says Young. "We had to be sure."

It was a Herculean effort, one accomplished with heads-down, just-keep-going determination. It was only when the reconstituted breeder's lines came back from a second multiplying winter in New Zealand that Booker breathed a sigh of relief.

"I felt pretty proud at that moment," she says. "We had 40,000 kilograms of breeders' seeds sitting on pallets and that's when I thought, 'Wow. We started with 150 plants.'"

The precious store of seed was distributed to pedigree seed growers this spring and everything is on track for the widespread release of transgene-free flax seed in 2014.

It has been a long, arduous and costly road back, says Booker, but the lessons learned go far beyond the flax sector.

"I think this is an historic event and also a wake-up call to other sectors, such as wheat, that are considering going GMO," she says.

"With canola, they were very careful to assess offshore markets before seed production began. But flax was one of the first crops to be genetically modified and that just wasn't thought of then. So that's the message: Think about what might happen down the road."

Once reconstituted lines are available, Prairie flax growers will try to regain their European customers, who have turned to Russia, Kazakhstan and Ukraine for supplies. That, too, will be a big job, but Booker is optimistic.

"I would like to see Western Canada's flax acreage up to three million," she says. "Then we can break out the champagne."

Feeding the World

PRAIRIE AGRICULTURE HAS A BIG ROLE TO PLAY IN THE EFFORT TO FEED A SOARING GLOBAL POPULATION

By Glenn Cheater

It may be the greatest question humankind has ever faced: H*ow to feed the nine billion people who will inhabit Planet Earth by 2050?*

Could a big part of the answer possibly be found in Saskatchewan?

Yes, say many experts, including Mary Buhr, dean of the College of Agriculture and Bioresources and one of the key promoters of a plan to create a University of Saskatchewan Global Institute for Food Security.

"When I was a kid, we were taught that Saskatchewan was the breadbasket of the world," says Buhr.

"That's not inaccurate now and it's going to become more so in the future. However, if you look around the globe at where the prairies are, the northern plains, you see places such as Ukraine, Kazakhstan, and Mongolia have the same kind of lands that we have. And you know what? None of those countries are managing their prairie resources as well as we are."

Buhr is the first to admit that dry and dusty Saskatchewan doesn't spring to mind for most people when they think about producing the food needed to feed an extra 2.6 billion people in the next 40 years. Surely, many would say, we need to look to the world's temperate areas, especially those which receive lots of rainfall.

But that low-hanging fruit was long ago plucked—in those areas and in most of the rest of the world, too, notes Robert Thompson, formerly dean of agriculture at Purdue University and director of agriculture at the World Bank, and now a senior fellow of the Chicago Council on Global Affairs.

"The crunch comes when you realize there's only 10 to 12 per cent more arable land that's not presently forested or subject to erosion or desertification," Thompson told a brain-storming symposium hosted by the U of S in April 2011, which led to the proposal to create the Global Institute for Food Security.

Moreover, there's a shortage of fresh water in most of those areas and it's

Changing Diets

"We not only have to feed more people but also a more affluent population, which will increase global demand for beef. The Canadian beef industry produces a high-quality, wholesome and environmentally sustainable product. In our sustainable beef systems research group on campus, we have individuals working from pasture to plate. Through research and graduate student training, they influence agriculture production in places such as Brazil, China, India, and Mongolia. So we're very well positioned to make a significant contribution."

JOHN MCKINNON, *Animal and Poultry Science professor, Beef Industry Research Chair, and an expert in beef cattle management and animal nutrition.*

Soil Sense

"With an expanding population, more and more marginal soils are being brought into food production. You can't push these nutrient-challenged soils beyond their capabilities or they quickly begin to deteriorate. In Western Canada, we've learned a lot about how to productively manage nutrient-challenged soils. This is knowledge that can be applied to other regions in the world."

DIANE KNIGHT, *Soil Science professor and an expert in the efficient use of nutrients by plants in both traditional and alternative cropping systems.*

only going to increase as the world's most populous countries become increasingly urbanized, he said. And while China and other nations worried about food security are buying up huge tracts of land in Africa, they face daunting prospects when it comes to storage and transportation infrastructure, as well as stable, functioning government.

To all of that, you can add one more factor, adds Buhr.

> **THE CRUNCH COMES WHEN YOU REALIZE THERE'S ONLY 10 TO 12 PER CENT MORE ARABLE LAND THAT'S NOT PRESENTLY FORESTED OR SUBJECT TO EROSION OR DESERTIFICATION.**

"Because of climate change, there's a whole bunch of the currently productive world on either side of the equator that's going to get lost to general agriculture," she says.

Still, Saskatchewan? Really?

As it turns out, there are an awful lot of places like Saskatchewan in the world, although words such as veldt, savanna, and steppe are used, instead of prairie, to describe them. And Buhr's critique of how they've been managed is gentle.

Consider, for example, Central Asia, which consists of Kazakhstan along with the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan. In the 1950s, the Soviets sent hundreds of thousands of its citizens to set up collective farms and they were soon growing wheat on 30 million hectares on Central Asia's steppes (there are only about 13 million hectares cropped in all of Saskatchewan). Although the first few crops did well, yields quickly plunged as the soil became exhausted or was stripped away by wind in that dry and fragile landscape. Millions of acres were abandoned. Even today, only about half that land is cropped and productivity is often pitifully low despite the break-up of the collective farms and importation of modern grain seeding, spraying and harvesting equipment.

It's the kind of situation that cries out for a Saskatchewan remedy, says Buhr.

"We know about productivity of prairie agriculture," she says. "And our expertise is exportable to other prairie regions around the world. We can make a tremendous difference by helping others make better use of their prairies, and by making them more environmentally sustainable and more productive."

Sustainable is the key word here. Kazakhstan has a John Deere distributor and the country is bringing over experts, including many from Canada, to assist in the adoption of zero-till and precision, variable-rate farming techniques. Those efforts will certainly pay dividends but Buhr says feeding nine billion will require a whole lot more.

The Green Revolution that boosted food production in the middle of the last century relied heavily on cheap fuel and fertilizer. But those days are

Integrated Solutions

"We've become very good at dryland crop production. We do it very well. Of course, we're heavily reliant on fossil fuels and we have issues with pests and resistance. I believe we need to develop integrated solutions that apply to all cropping systems. So my research has crossed over and we're using organic weed-control techniques in conventional agriculture to, for example, control herbicide-resistant weeds. Feeding more people is about productivity, and doing that with fewer inputs will be critical."

STEVE SHIRTLIFFE, *Plant Sciences professor and an expert in field crop agronomy and weed ecology.*

Systems Approach

"Food security is very much about producing more food. But there are many other considerations—sustainability; the environment and climate change; water and energy supplies; reducing waste and loss; storage and processing; enhancing nutritional quality; infrastructure needs; accessibility and affordability. We have resources and expertise in Saskatchewan and in Canada to apply to any of these issues. We have it all. The key is to understand where we can have the most impact."

BOB TYLER, *Food and Bioproduct Sciences professor and an expert in crop quality, utilization and food processing.*

over, and it will take a systems-based approach to boost production in the years ahead, says Buhr.

"This is what makes Saskatchewan such an amazing place to be—this province 'gets' agriculture and I mean agriculture in its entirety," she says. "So it's not just the production of crops and animals, people here understand the soil and environment; the air and water; and the entire resource piece. They understand the economics of it and the business side. They understand the science, policy, storage, transportation, all of it."

The university can offer much more than its expertise in areas such as plant genomics and development, animal nutrition, effective use of water and fertilizer, and land management, says Buhr. Equally important is the fact the university is part of a much bigger network, which includes groups such as Ag-West Bio and the Western Grains Research Foundation, as well as commodity organizations, business, and government, she says.

"Because people here really understand and appreciate what agriculture is truly all about, they're able to work together," says Buhr. "They're not only able, but keen to work together. That's vitally important when it comes to building something like this." ■

Like the task it has set for itself—sustainably expanding the world's food supply—the creation of an Institute of Global Food Security won't happen overnight.

But the university has done something similar before and is drawing on the blueprint it used to create the Global Institute for Water Security.

"In June, the University Council approved the creation of an Institute of Global Food Security," says Mary Buhr, dean of the College of Agriculture and Bioresources.

"That's a very clear signal the university is absolutely committed to this concept and approach, but it is only just the starting point."

As it did with the water security institute, the university has applied for funding for a Canada Excellence Research Chair and, if successful, will seek someone who is both an international authority in food security, and able to build and lead the new institute. To lay the groundwork for that, the university may offer a six- to 12-month appointment for a leading expert to come to Saskatoon and "get things started," she says.

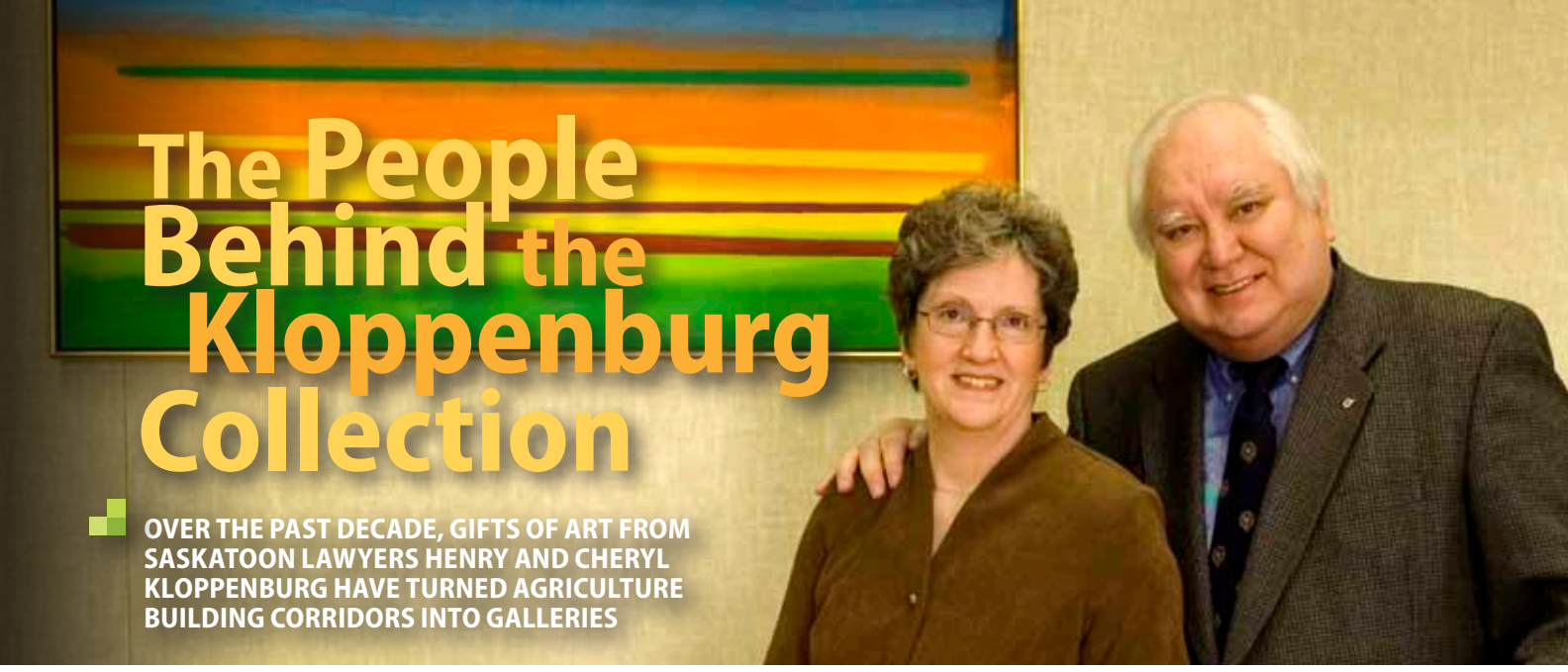
"Our intention is to make this institute recognized around the world as the place to be when you're examining global food security," says Buhr. "That means finding an individual who is among the world's best in this area."

But right from the start, the job will also involve bringing other Prairie organizations and experts into the effort.

"We're seeking other partners and trying to make this much, much larger," says Buhr.

The People Behind the Kloppenburg Collection

OVER THE PAST DECADE, GIFTS OF ART FROM SASKATOON LAWYERS HENRY AND CHERYL KLOPPENBURG HAVE TURNED AGRICULTURE BUILDING CORRIDORS INTO GALLERIES



Cheryl and Henry Kloppenburg

By Beverly Fast

Henry and Cheryl Kloppenburg have donated many pieces of art to the College of Agriculture and Bioresources, including an impressive collection of Inuit sculpture and several iconic Douglas Bentham sculptures ('Spring Day' and 'Spring Bloom') on the second floor, and paintings (including well-known works by Allen Sapp) on the 6th floor.

Why two prominent Saskatoon lawyers, both graduates of the U of S College of Law, have chosen to donate art to the College of Agriculture and Bioresources is a frequently asked question. The answer is simple enough. First, the Kloppenburgs believe art should be enjoyed year-round. "When you make a gift to a gallery, for example, the art might be displayed for a few months then put into storage for years," Cheryl says. "When we donate art, we prefer it to be seen."

Second, the Kloppenburg's were long-time friends of J.W.B. Stewart, dean of agriculture from 1990 to 1999, and his wife Anne. "During his years as dean, Stewart created an environment for art in the Agriculture Building," Henry says. "He was no longer dean when we made our first gift, but he was the reason behind it."

Henry has always viewed art from both an economic and an aesthetic angle. His family bought art in 1920s Germany as a hedge against inflation. As a boy growing up on a farm near Humboldt in the 1940s and '50s, he was exposed to art at home, at school and in the community (notably the paintings of Berthold Imhoff at St. Peter's Cathedral in Muenster).

Cheryl's early exposure to art was less auspicious. "I remember one trip to the Mackenzie Gallery in Regina where I saw a large white painting with a tiny black dot in the middle. It was called 'Dog Disappearing.' I turned to my mother and said, 'what a con.' So I started out very cynical of what abstract artists were trying to accomplish. Over time, I've developed more appreciation for abstract—I have three Perehudoffs hanging in my office."

Henry and Cheryl met and married in the 1970s. He had just returned from a two-year stint as a Rhodes scholar at Oxford University, where he earned a graduate degree in civil law. She had just finished her BA and was pursuing a law degree as well as a Masters in history. Their shared interest in art led to a 40-year adventure in collecting, during which they amassed some 400 to 500 pieces. Canadian artists have always been the focus. Over the years, they have collected works by A.Y. Jackson, Frank Johnston, Arthur Lismer, William Perehudoff, Dorothy Knowles, Ernest Lindner, Reta Cowley, Greg Hardy, Allen Sapp and Robert Hurley.

"Our philosophy of collecting is threefold," Henry says. "It has to be good art, it has to be art of sufficient stature to get appraised, and we have to be able to dispose of the art to galleries or institutions—we have to have an exit strategy." This exit strategy came into play when the Kloppenburg's downsized their living space in 2011. Many art works went to institutions, with the College of Agriculture and Bioresources being a main beneficiary. In 2000, the Kloppenburg's donated 27 paintings to the college. The Kloppenburg Collection was unveiled during the grand opening of the sixth floor addition to the Agriculture Building. Subsequent donations have expanded the collection to over 50 paintings—and 11 more Allen Sapp works in 2012.

In 2011, the Henry and Cheryl Kloppenburg Collection of Inuit Sculpture was permanently installed on the second floor. It includes 55 works by a variety of northern Canadian artists. Many are smaller pieces, which is one of the things that attracted them to Inuit art in the 1970s. "Sculptures were still tactile and portable, meant to be handled, passed around and carried from place to place," Cheryl says.

The Kloppenburgs are regular visitors to the Agriculture Building. "We get a great sense of joy and pleasure when we see the art on display," Henry says. "We also believe that when you see art around you every day, you take a little bit of it with you through life."

Dirt and Art

UNIQUE COURSE OFFERS A SMASH-UP OF SCIENCE, ART, AND UNCONVENTIONAL LEARNING

Art completed by students using pigments made from soils, plants and bones.

By Glenn Cheater, Photos by Ken Van Rees

If you're a fan of out-of-the-box thinking, then Emma Lake was the place to be this June.

That was where Ken Van Rees, five soil science students, and five fine arts students were making pigments out of dirt and bones – yes, bones – and then using the product to paint up a storm.

"It was a blast," says the soil science professor, who is also a painter. "I had collected soils from around Saskatchewan, some different reds and ochres, and I also brought a lot of deer and elk skulls. We would pull the teeth out, cut off the antlers, and put them in pipes with the ends capped. We'd throw them in the campfire at night and in the morning, grind them up to make black pigment."

Obviously, there was some science going on. If you heat bone in an anaerobic environment, you get a material that is mostly calcium phosphate, along with a bit of carbon and calcium carbonate. Add water and a binder to hold the pigment particles together—egg yolk was the ingredient of choice at Emma Lake—and you get bone black, a favourite of Rembrandt.

Van Rees and his students also heated soils rich in iron oxides to get intense red pigments, clays with the right mineral oxides to produce yellowish ochres, and extracted blue dye from a flowering plant called woad (a distant cousin of canola and cabbage) so they'd have a colour to capture the beauty of the northern Saskatchewan sky.

And there was art. All of the pigments were put to use—even the soil scientists had to wield a paint brush.

But the goal was something larger than the sum of those two parts, says Van Rees, who is, fittingly, an Agri-Food Innovation Chair (in agroforestry and afforestation).

It was an intellectual quest, one that began in innocent fashion eight years ago when Van Rees added an art element to his soil science field course by having his students paint a landscape. It was a fun thing, but also a way to give students a new perspective of landscapes they normally reduce into oh-so-precisely delineated components and subcomponents of soil science and biology.

It seemed to spark something in many of his students, and Van Rees spent "a long time thinking about how I could move this forward."

"Then I read an article in Canadian Geographic about this painter in Ontario who was collecting pigments within 100 miles of where he lived to create his painting," he says. "So I thought I'd go visit him."

Things soon fell into place. The artist, Christopher van Donkelaar, offered to teach Van Rees and any students who might be interested about the craft of making pigments. Art and Art History professor Allyson Glenn joined in the effort, and together they were able to win university approval for ARTS 898 Creating Paint from Soil (That number designates a 'special course.'). The students had to produce several paintings, write a paper, and put on a week-long exhibition.

But it was the process, not the end-products, that intrigued Van Rees. He still talks about being captivated by a 2009 lecture that renowned creativity expert Sir Ken Robinson gave at the university; and by the work of Steven Johnson, who describes how advances in both neuroscience and psychology have changed our understanding of the creative process. Robinson, a sharp critic of current educational models, favours divergent thinking and collaboration, while Johnson says hunches, serendipity, and even errors

Students painting at Emma Lake.

beat rigid linear thinking by a country mile when it comes to innovation. "Johnson writes about how innovation arises when you get different disciplines colliding together," says Van Rees. "While Ken Robinson said: 'Art techniques can be powerful ways of unlocking creative capacity and engaging the whole person.'"

When David told others about the course, many said it sounded really neat but "lots said it sounded weird." Both sides were right. It was very stimulating, but the "free-flowing" attitude of the arts students felt very odd at first, says the 26-year-old.

> "ART TECHNIQUES CAN BE POWERFUL WAYS OF UNLOCKING CREATIVE CAPACITY AND ENGAGING THE WHOLE PERSON."

Although that wasn't written down in the course curriculum, the 10 students who gathered at picturesque Emma Lake Kenderdine Campus didn't need it spelled out for them.

"It was just so different, you were free to try things out and see if they worked," says Cody David, who is taking his Masters in Soil Science and studying greenhouse gases.

"Sure, in science, you want to be creative when thinking what you want to do in an experiment, but then you follow the proper procedures and you're very methodical. The structure behind science is pretty rigid."

If fact, even when it was time to set up the gallery, the different ways of thinking were starkly evident. The soil science quintet knew the task and were ready to roll. The arts students were searching for the right experience, trying out endless arrangements and groupings.

"If it had been up to us, we would have done it in two hours," recalls David. "But the arts students were, 'Let's try this' and 'Now let's try it this way.' I mean, it took us pretty much all weekend. But I have to say it worked—what we had at the end of the weekend was way better than what we started with."

David now has a small gallery of his own, mostly landscapes, but also more detailed pictures of tree trunks. He says he's happy with the results, even though it was his first foray into art since high school.

Van Rees figures David and his fellow students have gained something else. He cites Robinson and the need "to engage the whole person."

"I sometimes think we don't think a lot about the student as a whole person," says Van Rees.

He doesn't claim to have discovered a new paradigm in teaching, but as he watched the students—whether cooking bones or struggling to capture the fall of light on a stand of trees —it was plain to see they were fully engaged and in high learning mode, he says.

"This was an experience that none of them would have ever had before," he says.

"It was unique, it was creative, and they were engaged in an eco-system in an entirely different way. And on top of all that, they got to make their own paint from scratch."

Lifelong Learners

TWO DECADES ON, U OF S GRADS DOUG AND DEAN ERICKSON ARE STILL IN STUDENT MODE AS THEY FIGHT TO STAY A STEP AHEAD IN FARMING'S NEW INFORMATION AGE

By Glenn Cheater

Two decades have passed since Doug Erickson earned his agriculture degree at the University of Saskatchewan, but his student days aren't behind him.

For example, earlier this summer, the 42-year-old farmer and agrologist from Rosetown, Sask. spent hours searching the Internet for scholarly articles and papers on fusarium head blight. The yield-robbing disease loves humid, warm conditions, and Erickson's clients were getting worried.

"It's not something we've had to deal with a lot in western Saskatchewan," says Erickson. "Every company out there claims it has the best product, but there's a lot of misinformation and confusion."

In addition to the 7,000 acres they farm with their parents, Erickson and brother Dean operate Greenleaf Agriventures, providing agronomy advice to half a dozen producers who collectively farm 40,000 acres. Timely advice is increasingly important. For instance, fusarium can easily cause five-figure losses on a large farm. That's why Doug constantly slips back into student mode.

"Recommendations for spraying wheat (for fusarium) in Western Canada ranged from 75 per cent headed to 50 per cent flowered—that's just a huge window and I knew there had to be a better answer," says Doug.

"I found a paper from Ohio State University that said you have to hit every head for maximum effectiveness when spraying," he says. "So right away, I knew 75 per cent headed wasn't going to accomplish what we needed to accomplish."

It's just one example of why today's agriculture has become a knowledge industry, says Doug. Producers deal with dozens of agronomic issues, and the penalty is high if you don't keep up with the latest research and technology. Doug can point to neighbouring farms he's familiar with that grow the same crops on virtually identical land, and yet one farm will generate gross returns that are $200 to $500 an acre higher—a million-dollar-plus difference on a commercial-size grain farm.

"You can't control Mother Nature, but these days you have to maximize everything you can—you're looking at big dollars," says Doug.

It's a view echoed by Dean, 40, who earned a Diploma in Agriculture in 1993. While his brother has a passion for plant science, Dean's is soil fertility. He had planned to return to the farm, but low grain prices at the time scuppered that idea. Both brothers worked as agrologists for other companies until this past winter, but always returned to the farm for seeding and harvest.

"It's always been a big deal for our customers that we farm," says Dean. "They know if we won't do it on our farm, we won't tell you to do it on yours."

> "THEY KNOW IF WE WON'T DO IT ON OUR FARM, WE WON'T TELL YOU TO DO IT ON YOURS."

The fact the brothers are now farming full time is testament to their determination. Their father, Don, had 960 acres and the farm stayed that size until 1996, when Dean bought a quarter section. Once Doug returned to the Rosetown area in 1999, they began seriously ramping up. But a larger farm meant they had to use their vacations for harvest, and work crazy hours during seeding.

"Dean and I would finish our regular jobs at five, drive to the farm and work, get home at midnight and then be back at work at six in the morning," recalls Doug. "I can't say that part was fun, but it was only a month a year and it's what we had to do if we wanted to get to the point where we could do it full time."

Doug (left) and Dean Erickson ▲

They also plowed virtually every nickel of profit back into the business, but it's no surprise that process took a dozen years. The brothers run modern equipment and today a new combine or tractor alone can easily top $300,000. Partnering with their father was critical (most of their land is jointly owned) and the improved economics of grain farming came at the right time, the brothers say.

"I didn't think we'd get the chance to do it because our farm was small and farming was poor when I went to university and for quite a while afterwards," says Doug. "Right up until 1999, I had pretty much resigned myself to the fact that it wasn't going to happen and all I'd get was maybe a week at harvest or something like that. So we both consider ourselves pretty lucky."

However, the Ericksons also made a lot of their own luck, using the skills they started developing at university to boost profitability.

"There's some who throw everything under the sun to produce a crop," says Doug. "Sure, what you put in determines what you get out, but you need to weigh the cost and potential benefits. It's a balancing act."

Finding that balance isn't easy. For example this spring, Dean —also a committed life-long learner—was conducting fertility research. Modern air drills allow farmers to place all of their nitrogen during seeding, but it's expensive—a typical rate of 100 pounds per acre would have set you back around $70 this spring. However, the same wet, warm conditions that foster fusarium in wheat significantly increase nitrogen losses due to leaching and denitrification.

But how much might those losses be? Would it justify the cost of applying a second application and, if so, what's the optimum split?

"This year, putting down 100 per cent of your nitrogen at seeding was not the best option," says Dean, who instead deferred one-fifth of his nitrogen fertilizing—and recommended his clients do the same—until the crop emerged.

Those are two examples among many. Every year brings new challenges, partly because growing conditions and disease pressures change, but also because crop science and technology are constantly moving forward. Staying in the forefront of agrology was the biggest reason the brothers started Greenleaf.

"Things change so much and so fast, you need to keep up," says Dean. "Our biggest fear in leaving the ag industry is getting out of touch. It's easy to get stuck in a rut, and that's what we wanted to avoid."

And both credit the skills they learned at university.

"That was the beginning of it," says Doug. "A lot of what I studied has no application for what I do today. But being able to know where to look—and how to analyze what you're looking at—is key. It was at university that I developed the thought process that I use all the time today." ■

Donor recognition

JULY 1, 2011 – JUNE 30, 2012

$1,000,000 +

149 Anonymous Donors gave $2,019,557.50

$100,000 to $999,999

Canadian Wheat Board
Saskatchewan Canola Development Commission
The Sprott Foundation
Jean Auckland Estate
John Loraas
Emily Robinson Estate

$10,000 to $99,999

BASF Canada Inc.
GNC Bioferm Inc.
Morris Industries Ltd.
Richardson Foundation Inc.
Saskatchewan Pulse Growers
Syngenta Crop Protection Canada, Inc.
William Farley Estate
Duncan MacRae
Morris Sebulsky

$1,000 to $9,999

Animal Nutrition Association of Canada (Alberta Division)
Bar-N Ranch and Cattle Company Ltd.
Bayer CropScience
Bourgault Industries
Bourgault Tools
Bunge
Chicken Farmers of Saskatchewan
Circle 62 Charitable Foundation
Danbred North America
Everitt Farms Ltd.
Farm Credit Canada
Gordon & Peggy Racine Family Fund
Gryphon Communications Inc.
John Buhr Farms Ltd.
New Life Feeds & Parrish & Heimbecker Ltd.
Novozymes Biologicals Limited
Shand Greenhouses SaskPower
Royal Bank of Canada
Saskatchewan Institute of Agrologists
Saskatchewan Pork Development Board
Saskatoon Horticulture Society Inc.
SaskMilk
Seed Hawk
Vancouver Fraser Port Authority
Viterra
Walker Wood Foundation
Colin Ahrens
Bob Bradley
Robert Byers
David Christensen
Terry Church
Vincent Coffey
Keith Downey
Eldon Ell
Lorne Fisher
Ellwood Fleming
Kent Fraser
Howard Fredeen
Allan Graham
Selina Hanley
Ethel Harmel
Ross Harmel
Jim Hart
Bill Heenan
Bill Hetland
John Hickie
Carl Holmgren
Rudolph Kaul
Ellen Leost
Bob Mitchell
Ken Pedersen
Marjorie Putt
Joan Redmann
William Rekunyk Estate
Thomas Robinson Estate
Brian & Laurel Rossnagel
Albert Running
Bernie Sonntag
Karen Tanino
Jim Tsukishima
Terry Veeman
Bernie Verwimp

$100 to $999

Allport Agro Ltd.
Bergstrom Farms Ltd.
BioAg Ltd.
Canadian Forage and Grassland Association
Canadian Pork Council
D & G Schlekewy Abattoir
E.G. Koester-Farm
Elite Stock Farm Ltd.
Fast Genetics
Flyin Dust Ranch
G. K. Connor Farms Ltd.
Greater Saskatoon Chamber of Commerce
Halchemix Canada Inc
Haverhill Organic Farms
Helvetia Farms Ltd.
Lonetree Livestock
Manitoba Pork Council
Mason Family Farm
Moose Jaw Exhibition Company Ltd
Pathways to Education Canada
Saskatchewan Poultry Council
Souris Creek Farm Inc.
T.J. Consulting Ltd.
Tebbutt Family Farms Ltd.
Walker Northeast Farms Ltd.
Tom Abrametz
Duncan Acton
Dale Adolphe
Irene & Derald Ahner
Ken Allan
Sandy Antonini
Troy Atkinson
John Babcock
Ken Baglole
Walter Baldwin
Eric Beamish
Albert Beattie
Dave Beckie
Joseph Bedford
Timothy Berscheid
Dave Bilanski
Omar Bilokury
Larry Bingham
Bryan Bittner
Dave & June Blau
Gordon Bligh
Murray Booy
Ian Bowie
Barry Bradley
Jay Bradshaw
Sheila Braidek
Stewart Brandt
Bill Brown
Donald Buchanan
James Calanchie
Lyndon Carlson
Diane Caron
Brian Carruthers
Harold Chapman
Sandra Christensen
Gunner Christiansen
Mary Clark
Charles Clay Jr.
Arlene Clemence-Kary
John Coldwell
Clarence Collins
Raymond Cooper
Bill & Gail Cooper
Bill Copeland
Stuart Cutts
Kirk Dammann
Jonathan Darragh
Jack Davison
Maurice Delage
James Dodds
Bob Dodds
Herb Dow
Julian Dumanski
Blaine Duncan
Robert Duncan
Jan Dyer
Ross Edwards
Gail Ehman
Stewart Elder
Delbert Enns
Jim Ewert
George Fedak
Jim Ferrie
Lloyd Fink
Keith Fournier
Arther Froehlich
Fred & Norma Fulton
Ron Gallaway
Allan Ganshorn
David Gehl
Robert Gilmour
Harvey Goehring
Albert Gorrill
James Gowans
Lynn Grant
Edward Gray
Renny Grilz
Grant Hale
John Hall
Robert Haller
Edgar Hammermeister
Tracy Hansen
Edgar Harder
Glen Hart
Lance Hartman
Bryan & Eileen Harvey
Elvin Haupstein
Larry Heavin
Murray Henderson
Samuel Herman
Ronald Hetland
Jack Hextall
Lorne Hextall
Harry Hill
Dale Holaday
Diana Holaday
Eric Holt
Wayne Holzapfel
Charles Hopkins
Forest Howell
John Hubert
Eric & Trish Johnson
Warren Johnson
Robert Jorgensen
Bill Kalyn
David & Lori-Ann Kaminski
Doug Kent
Erich Kerber
Denis Kirkham
Lorne Klein
Bernard Kotelko
Larry Koturbash
Armin Krahn
William LaClare
Dick Lane
Garth Larson*
Linda Leinan
Marc & Victoria Leost
Galen Loy
Ronald Marquardt
Stu Marshall
Don Martin
Allan McDougald
John McDougald
Shirley McKell
Peter McLaren
Roger Meyers
Bill & Hazel Miner
Patrick Mitchell
Ken Mitschke
Ranald Moar
Gordon Moore
Larry Morningstar
Ron Morningstar
Hewitt Murch
Donald Murray
Owen Myhr
Larry & Susan Nelson
Robert Neufeld
Jason Newton
Ronald Nielsen
Ernest Nycholat
Rhonda O'Hagan
Wayne Olson
Kevin Olson
Cali Orsulak
Robert Ostafie
Frank Osterwoldt
Stewart Palmer
Nicholas Partyka
Bryce Pashovitz
George & Lynne Pearson
Jack Peck
James Peltier
Joe Piontek
Jim Pratt
James Puckett
David Pulfer
Barry Raymond
Paul* & Dorothy Riemer

Ross Reynolds
Gary Rice
Wendell Rice
Garth Roh
Richard Ross*
Nick Rudrick
Barry Rugg
Ray Ryland
Donald Sanderson
Garry Schultz
Kenneth Scott
Leonard Scott
Cameron Seidle
James Sewell
Gregory Simpson
Cliff Simpson
John Slykhuis
Stanley Smith
Marianne Stamm
Elaine Stirton
Judy Stretch
Joan Svenson
Glenn Tait
Donald Tait*
Phil Thacker
Dave Thompson
David Thornton
Mike Torrens
David Torwalt
Marcella Tremere
Ted Turner
Trish Tweddell
Peter Valli
Edwin Walker
Murray Westby
Stewart White
Wayne White
Lee Whittington
Joe Widdup
Red Williams
George Wilson
Allan Wilson
Stacy Wilson
Robert Wolfe
Wayne Woolfitt
Arejay Wudrick
Robert Young

Up to $99

Agriculture Research Branch
G Double Bar Farms
Hannotte Twin Creek Farms Inc.
L.V. MacDougall Farms Inc.
Les and Wendy Trowell Seed Farm Ltd.
Meadowview Contracting Ltd.
Potash Corporation of Saskatchewan Inc.
Dylan Adderley
Heather Adie
Doug Alberts
Neil Alexander
Annette Allen
Wade Armstrong
Eldon Arndt
Bill Aulie
Jim Babcock
Wayne Bacon
Glenn Barclay
Barbara Barrett
Roger Barron
Russell Barth
Ken Bassendowski
William Bayda
Gerry Bell
Thomas Benson
Ron Bishoff
Irwin Blank
Kevin Bligh
Arden Body
Darrow Bottoms
Greg Bristow
Richard Brooks
Todd Brunas
Gordon Bue
Dennis Bulani
Glen Busse
Douglas Campbell
Robert Campbell
Allan Cannon
Daren Capcara
Lonnie Chupa
Joe Clavelle
Lori Cline-Flath
Malcolm Coakwell
Wayne Cochran
Gavin Conacher
Yvonne Couldwell
David Cox
Joseph Crooymans
Kevin Daniels
Glenn Derbowka
Judith Dickie
Keith Dryden
Blaine Dubreuil
Kathleen Duhaime
Bradley Dunnington
Murray Dyck
Murray Eichorst
Bruce Elke
David Ewart
Sharon Faye
Russell Fersch
Mervin Finell
Mindy Fladeland
Wayne Flaten
Brian Flavel
Clement Fontaine
Barbara Fowler
Randall Frei
Hubert Freitag
Doug Froehlich
Jeff Gaab
David Gallaway
Rodney Gamble
Don Geddes
Lawrence Gelleta
Dale Gibson
Evelyn Gilmour
Reg Gilstorf
Kevin Giroux
Brian Goranson
Mick Gould
Rick Gunderson
Jack Hamilton
Brent Hansen
Benjamin Harold
Larry Hayes
Vanessa Headford
Ryan Heavin
Wayne Henderson
Dorothy Henley
Janet Hoda
Allan Howell
Kenneth Howland & Marcia Clark
Kevin Hyshka
Wayne Ingell
John Jacek
Gordon Jacklin
Rick Jensen
Janet Jobe
Bobby Jones
Warner Kabatoff
Keith & Norma Kavanagh
Aaron Keisig
Ross Kingdon
Dale Knouse
Doug Korver
William Krell
Darren Kushner
Marie Lambie
Meron Lanoway
David Lazurko
Christopher Leader
Richard Lindsay
Robert Little
Alan Long
Ken Lumbis
Keith Lundgren
Cameron MacDonald
Boris & Anne Maduke
Joseph Martin
Nancy Martin
Mildred Maxwell
Kris Mayerle
Ted Mazurek
Gerry McCrie
Maureen McEwen
James McGillivray
Linda McGregor
Kent Mickleborough
Cherie Miller
Raymond Milne
Richard Myers
Brian Nattress
Marty Nervick
Jake Nickel
Rodger Niebergall
Peter Nordli
Bob Norman
Michael & Joyce O'Keeffe
Lois Orr
Lyndon Osman
Brendan Ostafie
Jeanette Pearson
Brian Peet
Elaine Pendree
Syd Pickerell
Hixon Pittman
Ronald & Margaret Plunz
Harold Popoff
John Raine
Donald Rawlins
Blaine Reble
Cornelius Rempel
Martin Rice
Dale Risula
Al Ritchie
Sandra Ritchie
Duncan & Lorraine* Robertson
Carrie Rogers-Butterwick
Louanne Roschuk
Sandra Ross
Emelia Samcoe
Kevin Sander
Lyle Sandercock
Art Sawatsky
Charles Shaheen
Pat Shaheen
David Sharpe
Ronald Shea
Kelvin Shultz
Brian Shuya
Mason Simmons
John Simpson
Iver Sletmoen
Craig Smith
Elwin Smith
Garry & Dawna Smith
Michael Southwood
James Spiers
Adam Spies
Judy Staszczak
Sherri Stender
John Stephenson*
Scott Stevenson
Harvey Stushnoff
Ralph Swanson
John Tatarynovich
Elaine Thomas
Brian Tochor
Timothy Tollefson
Kari Tosczak
Candace Vanin
Lorne Veitch
Michael Volk
Harvey Wagner
Gerald Walkeden
Sandra Watson
Bill Weighill
Dianne Westerlund
Clarence Weybrecht
Art Wiebe
Dean Wilgosh
Don Wilkins
Gerard Woynarski
Dennis Zackrisson
Kari Zemlak
Aaron Zubot

Gifts in Kind

Fast Genetics – Piglets for AgBio Discovery Program

John Loraas – Grain storage units

Henry and Cheryl Kloppenburg – Gifts of art

Prairie Swine Centre – Feed for AgBio Discovery Program piglets

Ron Cruikshank – Alfalfa hay bales

Catons Ltd. & DeLaval Canada – Dairy equipment

Equipment Contribution Agreements

Morris Industries Ltd. – Morris Contour Drill & Air Cart

Western Sales and Farm & Garden Centre of Saskatoon – John Deere Self-Propelled Sprayer

New Holland Canada – 2 New Holland Tractors

* Denotes deceased

We would like to acknowledge and celebrate the generosity of those who have arranged planned gifts to the College of Agriculture and Bioresources. These gifts are tremendously important to the future of the college. For their forethought, we sincerely thank these donors who have recognized the potential of the College of Agriculture and Bioresources.

College of Agriculture and Bioresources story rooted in innovative thinking

The College of Agriculture and Bioresources has been a consistent strength for the University of Saskatchewan through its research, teaching, outreach and technology transfer. With a century of experience, the college has a storied history of innovation in products and practices that have transformed our world.

1912

Regular classes in the College of Agriculture begin

1914

The Better Farming Trains visit rural Saskatchewan with the latest agricultural information until 1922.

1915

First Bachelor of Science in Agriculture awarded with 24 graduates.

1922

First Master of Science degree in Agriculture awarded.

1937

The School of Agriculture established to administer the diploma program.

1953

First Ph.D. degree in Agriculture awarded.

1956

The first commercially practical dairy-calf milk replacer developed by J.M. (Milt) Bell.

1971

The Crop Development Centre set up to expand crop-breeding research and has since developed more than 380 crop varieties .

1990

Partners in Growth Campaign, led by 'Sodbusters', alumni and friends of the college, raise nearly $13- million to contribute to construction of a new Agriculture Building.

1990

Meat research program established.

2005

Bachelor of Science in Agribusiness established.

2006

Establishment of the Indigenous Peoples Resource Management Program.

2007

Bachelor of Science in Renewable Resource Management established.

62 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 **2012**

1972

Kernen Crop Research Station, now a first class crop and ecology research unit, is developed.

1978

The first Canadian bred lentil, Laird, registered by Dr. Al Slinkard.

1991

Agriculture Building official opening.

1998

The School of Agriculture as an administrative unit is disbanded.

2006

Name changed to the College of Agriculture and Bioresources to better reflect the scope of research and teaching.

2012

Bachelor of Science in Animal Biosciences approved for a first offering in September 2013.

All the details, all the time.


THE WESTERN PRODUCER

HOW CLEAN IS YOUR KITCHEN? | P106

BEST NEW FARM EQUIPMENT | P44

AE50s AWARDS

POPULAR DINING SPOT

Time to lock in fertilizer prices?

Increases coming | Analysts believe prices will rise within weeks

Imported food faces less scrutiny

CFIA accused of misleading MPs | Union says only two percent of imports are inspected

To subscribe call us Toll Free at
1-800-667-6929

Check us out online at
producer.com

Sign up for our
Producer Daily
email newsletter

View us on your smartphone or tablet at
producer.com

When you need agricultural information, we're there.

THE WESTERN PRODUCER

Invest in Knowledge. Give Today.

Credit Card Payment

|_|_|_|_| |_|_|_|_| |_|_|_|_| |_|_|_|_|

Card Expiry Date: _____ / _____ (month/year)

❑ Visa ❑ Mastercard ❑ American Express

_____

Name (as it appears on the card)

_____

Cardholder Signature

Is this a corporate credit card? ❑ Yes ❑ No

_____

If yes, please provide the name of the company

❑ Cheque/Money Order (payable to the University of Saskatchewan

I'd like to make a gift of: ❑ $50 ❑ $100 ❑ $250 ❑ Other $ _____

Donor Information **indicates required information*

_____

*First Name *Initial *Last Name

_____

*Address

_____

*City *Province *Postal Code

_____

*Telephone Email

_____

Your preferred published name:

_____

This is a joint gift with:

If you choose not to be publicly recognized for your gift, we will honour your wishes. Please do not publish my name with regard to: ❑ this gift ❑ all gifts

Programs and Projects at the College of Agriculture and Bioresources

I would like to direct my gift to:

❑ **General College Donations** – used to support a variety of college and student priorities

❑ **AgBio Discovery Program** – supports youth and community engagement in AgBio Science

❑ **Student Enhancement** – supports student development opportunities and travel

❑ **Building Fund** – used for enhancements and ongoing building upgrades

Are you interested in learning more about leaving a gift through your will or estate plan to support students or research at the college?

❑ Yes ❑ No

For more information about giving options such as setting up pre-authorized debit payments, to determine if your company matches gifts or to discuss other payment types of gifts such as bequests or securities, please contact:

Hamish Tulloch, Development Officer
College of Agriculture and Bioresources
University of Saskatchewan, Sasktoon, SK S7N 5A8
Tel: (306) 966-8893
Email: hamish.tulloch@usask.ca

Visit us at www. agbio.usask.ca to learn more about the College of Agriculture and Bioresources.

Canada Revenue Agency
Charitable Organization Registration
No. 11927 9313RR001

University of Saskatchewan
College of Agriculture and Bioresources

THANK YOU. Your donations directly impact education, research and student support.

RETURN UNDELIVERABLE CANADIAN ADDRESSES TO:
College of Agriculture and Bioresources
University of Saskatchewan
51 Campus Drive
Saskatoon, SK S7N 5A8

UNIVERSITY OF SASKATCHEWAN
College of Agriculture
and Bioresources

PUBLICATIONS
MAIL AGREEMENT
NUMBER 41255028