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The Truth About GMOs

Despite widespread public distrust, science is conclusive: GMOs are safe



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GREENHOUSE

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UNIVERSITY OF ALBERTA
FACULTY OF AGRICULTURAL,
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FEEDBACK

Taking exception to our expert's take on the Alberta climate change plan

Re.: the carbon tax and how it affects rural Albertans

The 'expert' opinion is that "people in rural communities ... so they're going to feel it more at the pumps. But this is going to be a drop in the bucket..."

It may be true that we rural Albertans are a small proportion of the total population so are insignificant in the provincial planning scheme of things, but I thought this was a rude statement and careless brush off for the readers of your magazine—mainly a population focussed on agriculture. This is certainly where your faculty has come from, even if it is broader now.

It also does not address the fact that the food producers of the province are affected by this tax in terms of production and not just their access to services and amenities of living, which the urban population takes for granted.

Rural people are the least likely to benefit from the increase in public transportation which is supposedly to be funded from this carbon tax. In my experience, farms do not generate profits margins which encourage the farmer to burn fuel irresponsibly so the only way to reduce usage is to reduce acreage.

Operations like greenhouses struggle even more and I personally know of two which have closed this

year in anticipation of the huge increase in costs.

Presumably food consumption is not going to decrease so anything not produced in Alberta will have to be imported from elsewhere.

Rosemary Brown

'73 BSc (Ag), '74 MSc (Ag. Econ)

Editor:

While it doesn't appear you are soliciting comments on your publication, as a past graduate (MSc. 1988) of the same department (of course it was named differently back then), I feel compelled to comment on your interview with Debra Davidson for your cover story.

I don't want to initiate a debate on whether taxing Albertans an additional \$3 billion annually and raising their power bills dramatically, capping off energy extraction, plus killing an industry that provides 4,500 family-supporting jobs in rural Alberta is justified in the name of climate change. The author and editors of your publication clearly believe so, while others, including those more directly impacted by these policies may have a different opinion.

What I found most objectionable was the tone of the "interview" and its complete lack of impartiality. As I read through the article I kept looking for the NDP logo; I'm sure no one in the

party itself could have done a better job of presenting their viewpoint. A thinly veiled contempt for those who choose to live in rural Alberta, or even worse, make a living from the mining or extraction of hydrocarbons, was evident. Don't complain about 6.7 cents/litre higher gas prices, just forego the weekends attending rural hockey tournaments and keep the kids at home, with the thermostat turned down. Surrender your well-paying job in electricity generation and soon you may be lucky enough to be retrained as a solar panel scrubber or wind turbine repair person.

At one time, the department which employs Debra Davidson was a force advocating for a strong and vibrant rural economy, but clearly those days are long gone.

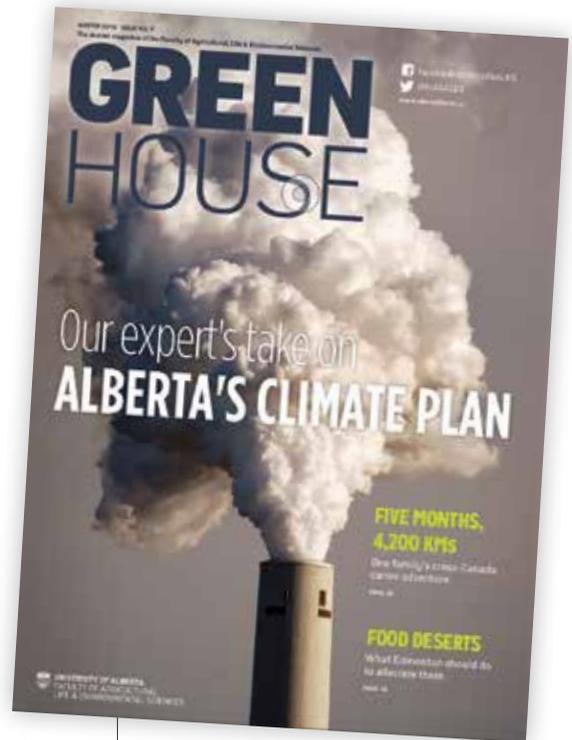
Ron Gietz

'88 (MSc)

Dear editor:

Debra Davidson minimizes some of the challenges involved in implementing the Alberta government's climate change strategy.

For example, she states that "Alberta has some of the best solar resources in the world." In fact, the best solar potential in the world is in



places closer to the equator, which receive twice as much solar radiation per unit area as Alberta. More than half of the world's land surface receives more solar radiation than Alberta.

Households that struggle with increased energy costs "have the option to change their emissions" by "insulating and sealing the home" and "using more energy efficient appliances." So, families that are struggling to pay their utility bills can buy new appliances. It's so simple.

"The costs of wind power are coming down." True, but they're nowhere near as low as gas or coal.

Solar and wind are complementary because "solar is more active in the day and wind is more active at night." This is not true. Peak demand is on winter evenings when no solar power is available, and the wind may be reduced to near-zero for several days. Any reduction in coal-fired capacity must be compensated for by importing electricity from outside the province, or building new gas-fired generators or nuclear reactors—the cost for which will be added to everyone's electricity bills. It seems that Dr. Davidson's

enthusiastic approval of the NDP plan is more ideological than scientific. Nowhere is this more clear than in her statement that "we tend to forget that the revenue that's collected will be invested in things that are positive for Alberta." In other words, government knows best. Really? If the Conservatives had foisted a 3-billion-dollar tax grab on Alberta, would they also have been so completely trusted? Sincerely,

Peter Englefield
'95 MSc (ENCS)

Debra Davidson is shown to say in regards to the Alberta government's climate change strategy, in reference to the oil and gas industry, "We have lots of other options available to us here."

Missing is the rest of the story is "if money is not a limiting factor."

Kind of like the economics classes I was part of where all kinds of theories are said to "work" so long as everything else remains the same.

Nothing is the same, particularly the oil and gas revenues to governments that support universities.

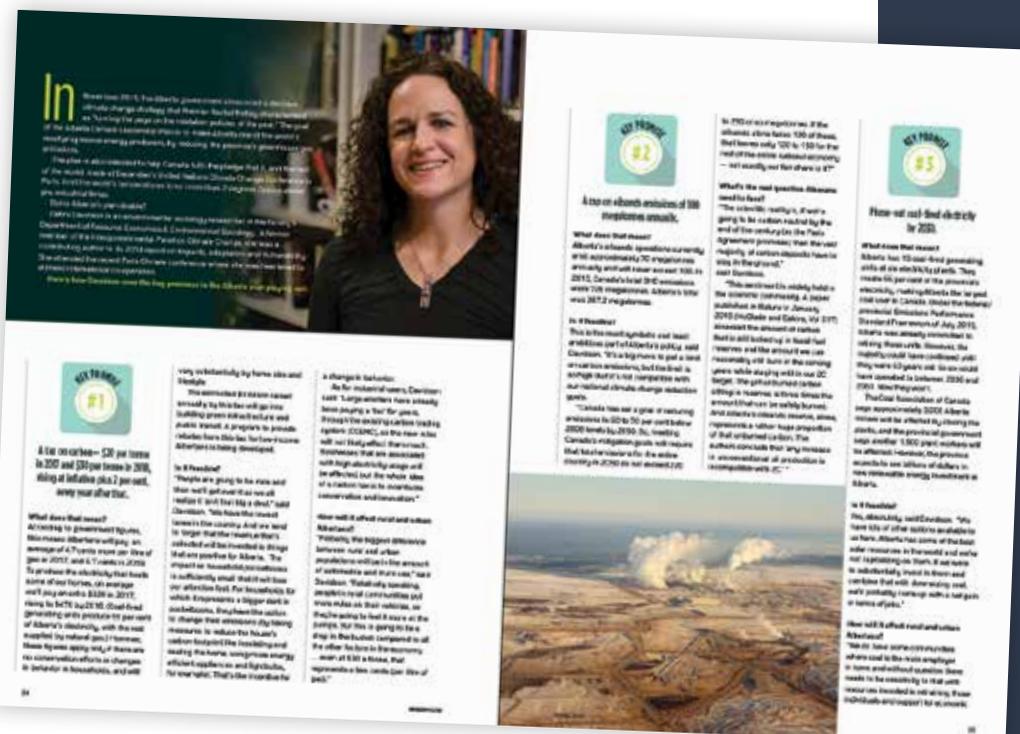
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We welcome readers to submit letters to:

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Letters should include the writer's full name, address and home telephone number, and may be edited for purposes of clarity and space.



AG/FOR

HOW WHAT WE DO AFFECTS THE FOOD YOU EAT

The Agriculture/Forestry Centre, or the Ag/For Building as it's more commonly referred to, is the administrative hub of the faculty. It's centrally located in the heart of the North Campus but a good deal of the agricultural research conducted by faculty researchers takes place on South Campus, commonly known as the university farm, and other research stations primarily in and around Edmonton. Starting on page 18, we take a deep dive into how the agricultural research conducted on South Campus continues to affect what you eat every day. *▀ Proulx*





AWARD

ALES virologist wins 2016 World Agriculture Prize

Lorne Babiuk showed great promise as a young researcher. Early on in his career as a virologist, he worked on rotovirus—a devastating disease that can be fatal for calves—and devised a new technique to grow the virus and then developed a vaccine to control it.

It was the first of six vaccines Babiuk played a major role in developing over the years.

“One of the things that veterinarians or cattle producers don’t want to see is young calves dying and they can’t do anything about it. If the cattle producer in

southern Alberta loses 25 per cent of his cattle, that has a huge economic impact but then in the developing world, the 600 million smallholders—many of them are women—they have four goats. If one dies, that means a child may go to bed hungry and we know that nutrition and proteins specifically influences cognitive development in young children. So this has an impact on their livelihood and their ability to function in the future,” explained Babiuk.

For his efforts at safeguarding the health of animals and people worldwide throughout his entire

career, Babiuk was awarded the 2016 World Agriculture Prize bestowed by the Global Confederation of Higher Education Associations for Agriculture and Life Sciences.

Babiuk is an accomplished scientist who has won numerous international awards for his leadership in vaccine development and research in veterinary infectious disease control, particularly diseases that spread from animals to humans. But this prize, he says, “ranks at the top. I’m in medicine. I’m in agriculture. These are often two solitudes and to be able to link them and get international awards—it’s very gratifying when you can make an impact that is recognized by two completely different groups.”

Although Babiuk has been vice-president of research at the University of Alberta for the past nine years and will retire from the position next June, he has continued to maintain an active research program. He’s in the middle of developing his seventh vaccine, which will protect sheep, goats and cattle from five diseases and an eight vaccine that will protect poultry from various diseases.

“There is so much to do. You can’t rest on your laurels,” said Babiuk. 🍀

Proulx

Lorne Babiuk won the prestigious 2016 World Agriculture Prize for his work in vaccine development.



SUPPLIED



CHANTELLE SEDGWICK

ALES Summer Program Offers Canadian Experience

Scott Chang conducts a class to a group of 15 Chinese students who participated in the first ALES Summer Program last year. The program—which is being offered again this summer—offers students from outside Canada the opportunity to study at the U of A for a month, hone their English language skills and learn about Canadian agriculture and natural resource management. The students visited many ALES research stations and also took the time to see the Rockies.

PREPARING FOR A CAREER

Capstone courses give graduating students a market edge



HELEN METELLA

Fourth-year Nutrition and Food Science majors Cara McLean and Rim Bzeih developed a prototype of a food product in their capstone course, just as they'll be expected to do on the job market.

For fourth-year ALES' Nutrition and Food Science majors **Rim Bzeih**, **Olivia Thompson** and **Cara McLean**, the goal of their capstone course was precisely what a professional position might demand: develop the prototype for an actual food product.

The students created a cheesy tasting, vegan zucchini chip. It required umpteen slightly different iterations, testing not only their food technology skills but their perseverance and confidence.

It was a bit scary at the beginning when we failed several times and we thought we weren't going to be able to do it on time," said Bzeih. "I learned that patience is something highly needed in my field and that group work makes better ideas and results."

Paying heed to the many required non-technical steps—from quality inspection and hazard analysis, to marketing and scale-up—deepened the learning.

Thompson was promptly hired as a product development technologist for the Government of Alberta, and believes that the capstone course was instrumental in her landing the job.

Capstone courses offer ALES students a comprehensive assignment in which they work in teams solve a challenging practical problem in their field by drawing on everything they've studied to date. The project emphasizes critical thinking, and must have substantial scope. It also

demands ethical and professional conduct from students, and includes oral and written communication.

Associate dean for research Anne Naeth helped create the capstone guidelines for all ALES programs in the early 1990s.

"Most of the work we do is not a solitary science," said Naeth. "So much of what we do is interdisciplinary. We have to work with people, and if we don't work with them we have to deal with them, solving their problems."

She added that capstone courses call on both technical and social skills, a combination sought after in applied science jobs.

For example, in this year's capstone course in animal science, students working under instructor Paul Stothard produced 12 research-supported, consumer-friendly posters on animal health care. They will be posted around the city by Edmonton's Alberta Helping Animals Society, an organization that provides veterinary services to low income individuals, with a goal of preventing issues that can lead to veterinary bills.

Such outreach summarizes the value of capstones, said Stothard.

"Students make connections that can lead to employment, have the opportunity to develop their professional skills, and get a taste of the real world."  Metella

STUDENT AWARD

Budding fashion designer wins new scholarship

BY HELEN METELLA

The Department of Human Ecology's strong track record in a national fashion design competition earned it a new scholarship this spring and an undergraduate is the happy beneficiary.

Francesca Bombini won \$1,000 from Telio, one of North America's leading fabric producers, for a chic dress she designed for an advanced apparel design and product development class.

"It was tasteful, minimalist and she really followed the requirements and reflected on them perfectly," said Vlada Blinova, who teaches the course and set the parameters for the scholarship.

The winning garment needed to be inspired by a piece of visual art and use unconventional construction techniques and specialty fabrics.

Bombini won with a festive black mini dress inspired by Jackson Pollock's paint-drip composition, #5 1948. The abstract canvas looks black, grey and white until closer scrutiny

reveals cleverly understated inclusions of yellow and red, too. Until last year, the famous work held the record for the highest price ever paid for a painting, after it sold for \$140 million in 2006.

That combination of restraint and luxury is echoed in a dress made of stretch taffeta, inset with organza that's altered by needle felting. The latter is a technique in which strings of wool yarn are woven into the organza to make it both crinkle, and to add texture and colour.

The judges, including local celebrity designer Malorie Urbanovitch and Human Ecology instructors Lori Moran, Jane Batcheller and Kathryn Chandler, unanimously approved of the interpretation.

"Because this piece of art is so busy, I simplified the colours and motions of it," said Bombini, a 21-year-old who said the process taught her to appreciate how striking simplicity can be.



Telio, a Montreal company that has sponsored a national competition called Canada's Breakthrough Designers for a decade, changed the contest's format this year. Instead of whittling down national submissions to five prizewinners receiving varying cash awards, it offered a \$1,000 scholarship to each of the schools that have participated and done well in the past.

The Clothing, Textiles and Material Culture program in Human Ecology qualified because it has made the competition's finals three times in the past five years. 🍀





BUDDING PRODUCT DEVELOPERS

NOVEL PRODUCT EARNS STUDENTS TRIP TO INTERNATIONAL FOOD SHOWCASE

Three Nutrition and Food Science students took to a major international stage last July, showcasing their ingenious recipe for a gelato made from pulses.

The team of **Austen Neil**, **Chandre Van De Merwe** and **Nicolle Mah** placed second at the national competition for Mission ImpULSEible in February, with a scrumptious yet nutritious treat called BiotaGelata. Made with fermented white beans and kidney beans as its milky base, it dazzled the taste buds in four different flavours—maple walnut, passion fruit, dark chocolate and cassis.

Only the first-place winners were scheduled to get an all-expenses-paid trip to Chicago for the Institute of Food Technologists Annual Meeting and Food Expo to showcase their innovative food product, but the judges were so impressed by the flavours, textures and novel concept behind the students' gelato that the provincial industry body, Alberta Pulse, decided to provide support for this team to attend, too.

"This is the students' chance to make contacts in the industry as well as potentially find a company

or food processor who might be interested in their innovative pulse product," said **Debra McLennan**, food and nutrition coordinator at Alberta Pulse.

Indeed, the event is one of the largest food expos in the world, where more than 20,000 attendees from the food industry can view and taste new products, including this unusual product—which is officially titled a "gelata" because gelatos contain real milk.

The University of Alberta students were intent on creating something that didn't just add pulses to existing food, but actually used them in a manner not tackled before, said Neil. The team also took to heart the advice of **Lech Ozimeck**, its academic advisor, who told them that sometimes the best idea is to simply replace a singular ingredient and do it well.

They decided to replace regular milk with beans fermented for several hours as the gelato's base.

"The fermentation process worked to break down the volatile beany compounds and turned the bean milk into a liquid that tasted like yogurt," said Neil. *Metella*

FORMER DEAN EARNS SPOT IN ALBERTA AG HALL OF FAME

After spending his entire career helping to build the agricultural sector in Alberta, former ALES dean John Kennelly was recognized for his many outstanding achievements by being inducted into the Alberta Agriculture Hall of Fame this past winter.

Kennelly was recognized as one of the dairy industry's most respected experts who made several breakthroughs resulting in major productivity gains through various feed formulations—which used Alberta crops—and increased health for dairy cattle.

Kennelly taught dairy science and nutrition to thousands of students and built world-renowned research programs from scratch. He served as department chair and later as dean of the faculty, where he oversaw substantial growth in student numbers and external research funding.

Among his other major accomplishments, he founded the Western Canadian Dairy Seminar, recognized as one the top three in the world, and serving as its director of programming for 25 years. He also led the establishment of Agri-Food Discovery Place, a university-owned pilot plant facility that supports innovative research, training and technology transfer. *Proulx*

Agriculture and Forestry minister Oneil Carlier presented John Kennelly, seen here with his wife, Louise, with a plaque for his induction into the Alberta Agriculture Hall of Fame.



HAPPENINGS

Two ALES students offer personal reflections on their life-changing trips, one to Cuba, the other to India. The Faculty of ALES offers community service-learning trips to a limited number of students during the winter reading week, each February.

STUDENT EXPERIENCE

Cuba offered chance to reconnect with the basics of food harvesting

BY CELINE MAGALONA

I joined the Cuba Agro-Eco 2016 study tour because I love exploring and learning about new places. I am particularly intrigued by other countries' food practices. I wanted to learn about how Cuba's history and culture shaped the way food is perceived, handled and farmed. I hoped to learn about Cuba's traditional diet, compare and contrast it to what we commonly eat in Canada, and try to understand why the differences exist.

During this trip, my expectations were more than met. We visited a dairy farm where we helped harvest sugar cane and saw how it was processed for animal feed. We visited organoponicos, which are urban gardens. They were dispersed everywhere within Cienfuegos, the city we stayed in. Developing organoponicos everywhere was one of the agricultural strategies Cuba came up with to become self-sufficient following trade sanctions against the country after the revolution.

Another highlight was visiting a rural mountain community, a small village that housed 100 residents and had only started relying on electricity two years ago. It was amazing how incredibly self-sufficient the mountain community was.

During our visit to a fruit farm, we shelled beans by hands by repeatedly knocking the hardened shell with a stick as it rested on another piece of wood. It was fun to consider that we



were doing a job with our hands that is normally done by machinery in North America. It made me think of how able we are to cultivate food, even with the most rudimentary of tools. It was nice to be reconnected with the basics of food harvesting.

A majority of crops in Cuba are grown without the use of chemicals or pesticides. The country was unable to import them for so long that not using them has become the standard. Thus, most of their food may be considered organic by Canadian standards although the Cubans do not have an organic designation.

I also really enjoyed their freshly brewed coffee, made from freshly picked ground beans!

Every country has a way of producing food that best suits it and the Cuban style was simple, minimalistic and incredibly refreshing. Visiting Cuba was like traveling back in time to a world where everyone felt more connected, alive and deeply rooted in what they do, no matter what job it was.

It was a very inspiring trip; one that I will never forget and will likely continue to talk about for a while. 🌿

STUDENT EXPERIENCE

Trip to India offers agricultural and cultural learnings

BY STACEY BERRY

To many Canadians, Valentine's Day is not a holiday to look forward to. However, for 12 students last year, waking up on Valentine's Day meant waking up to the sound of tropical birds and frogs, and—weirdly for February—sweating.

That was our first morning during the ALES Alternative Reading Week in India, but the whole trip was far more incredible than a relaxing morning. We worked with Pipal Tree, an organization that is working on social issues in India, such as improving women's rights, the struggles of the relocated adivasi (the tribal people of India), and agriculture in India. The 12 ALES participants coming from various backgrounds made the trip enriching in multiple ways.

I, for instance, am in the crop science program and therefore I was particularly interested in the agricultural practices used in India. We often mention India in the classroom, but actually speaking with farmers was fascinating. It was astonishing to learn that there are no weeds to small farmers in India; every plant that grows has a purpose, from medicine to green manure. It was also interesting to learn that women are the ones doing most of the field work, which

tends to be a male-dominated industry in developed countries.

Most of the participants on this trip were young women, born and raised in Canada. Having this background, we are accustomed to equal rights and freedoms given to us, therefore entering a culture such as India's was eye-opening to all of us. We saw a real women's suffrage movement and met strong, empowered women who are changing their lives as well as those of others. It was truly amazing to witness these women facing endless obstacles but pressing through with their heads held high.

The highlight of this trip was the afternoon we visited the children's

college, where 20 adivasi boys and girls were being taught a combination of modern education and adivasi history and traditions. We watched their talented performances and then we attempted to teach them North American line dances. That quickly turned into a dance party with the children providing all the music needed. The most wonderful part of this activity was seeing the power of smiling, dancing and music transcend the language barrier. Seeing these children being given such opportunities brought warmth to our hearts and we look forward to a future that allows these children to fulfill their ambitions. 🌱



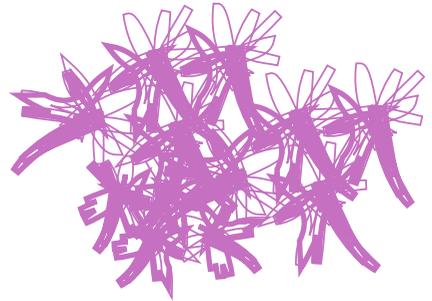
COURTESY OF STACEY BERRY





CLIMATE CHANGE

Alberta wildflower helps scientists plan for climate change



Transplanting plants from one location to another may be an important tool to ensure some species don't become extinct as the climate changes, new ALES research suggests.

MSc student **Jennine Pedersen** studied the Northern or Meadow Blazing Star, a plant native to Alberta that grows only in a narrow section of the Central Parkland region.

In 2012, her supervisor Scott Nielsen relocated adult plants and seeds to three different areas of Alberta: east of Calgary, north of Fort McMurray and within the plant's current growing district.

The adult plants did OK in all environments but seed establishment in the south was terrible.

"(It suggests) that this species will face unfavorable conditions in its current range, leading to issues with long-term viability," said Pedersen.

In the region within its current range, Pedersen found that seeds had a five per cent establishment rate, while in the north it was four times higher.

"Suitable habitat is already available to the north that would allow us to do something about it (and) there are going to be winners and losers in climate change and it boils down to what we want to take care of," said Nielsen.

"In some cases, assisted migration will be a tool that we will need to use if we want to preserve our biodiversity." ❖

Metella

CARING FOR THE CAREGIVERS

Canada needs to take better care of its family caregivers

Canada needs a comprehensive strategy to support family caregivers who bear a disproportionate share of the cost of assisting adults with long-term disabilities, according to a recent study by ALES researcher **Janet Fast**.

"Families are struggling to meet conflicting demands of paid work and care giving," said Fast, an economist who specializes in the economics of aging and the paid and unpaid care work of family members. "For many, the difficulty of balancing both responsibilities have left them no choice but to miss days at work or reduce their paid work hours."

The issue also presents challenges for employers, which may face increased turnover, absenteeism, reduced productivity and more demands on employee benefit programs.

Fast suggests Canada should follow the example of the U.K. and Australia.

"(They) have recognized caregivers' contributions, introduced an allowance or wage to help cover caregivers' income security needs, and explicitly codified caregivers' rights in legislation," she said.

Fast calls for a comprehensive caregiver policy strategy based on four pillars:

- recognizing caregivers and their rights,
- adequate, accessible and affordable services for care receivers and caregivers,
- work-care reconciliation measures, and
- measures to protect caregivers' income security.

The report was conducted for and published by the Institute for Research on Public Policy. ❖ *Proulx*

BIORESOURCES

New process converts canola oil into green building materials

A process invented by ALES researchers that converts canola oil into organic polyol, or biopolyol, the basis of a greener kind of polyurethane, has been commercialized and is being used to create spray foam insulation and roofing panels.

Vancouver-based Consolidated Coatings licensed the process developed by lipid chemist **Jonathan Curtis** and built a plant to produce the biopolyol, now called

Liprol™. It is being used, along with other chemicals, to manufacture BioFoam™, a new bio-based spray foam that is 25 per cent bio-based, well above what's currently on the market, said Curtis.

The product should be available for residential applications in two to three years.

BioFoam's insulation value is very high and it also acts as a vapour barrier. Spray foams in general are desirable because they don't compress, sag and lose R-value, in the way fiberglass batting often does, Curtis said.

Edmonton-based Spraysulate and Mod-Panel will make roofing panels and apply versions of BioFoam™ to other insulation products. Another partner is Green Analytics, which will be involved with future

building-energy audits to demonstrate the savings from using BioFoam™.

Curtis and his team will work on many other applications for their biopolyol product including adhesives, coatings and composite materials. 🍌

Metella



FOOD

Are consumers willing to pay cost of certified meat?

Meat sold as certified by a particular system is not necessarily produced from animals treated more humanely than those whose meat comes without a certification. What it means is that the producer is audited and certified by a third party to be producing to particular guidelines that are publicly accessible.

For producers, this means more record keeping, adherence to a set of rules and participation in an audit on some regular timeline. These things clearly add cost for producers, possibly for their buyers, and certainly for consumers.

Not all consumers in Canada are willing to pay extra for such programs? For many of us, food prices are a high cost and we are going to maximize our food budget through buying the lowest-priced products we can find.

Research done here at the University of Alberta and elsewhere shows two things: Higher income levels are a good indicator of a willingness to pay higher prices for identified animal-welfare characteristics, and everyone strongly prefers certified standards with the certification information appearing on the product.

Food decisions are complex. In our research, we have noticed that the more frequently you eat a product, the less interested you are in extra certifications. When dining out, yes, you have concerns; serving company at home, absolutely; but maybe not so much for the meal in between work and soccer practice. 🍌

Condensed version of an opinion piece originally published in the May 6, 2016 online edition of the Globe and Mail, written by ALES food economist Ellen Goddard

Sustainability isn't only something we teach in the classroom. With 60,000 people learning, teaching and researching on five campuses, the university is our own biggest research project. Together, we are learning to build a more sustainable world, for today and tomorrow.

CONSERVATION



50% reduction
DOMESTIC WATER USE
2014 vs. 1976



90 per cent
OF WASTE DIVERTED
FROM THE LANDFILL
by 2020



500 kW
ON CAMPUS SOLAR
ELECTRICITY
BY 2020

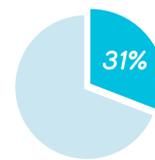
SUSTAINABLE AGRICULTURE



Weekly Farmers' Market
21 LOCAL VENDORS, 600 SHOPPERS
AND \$8,400 IN SALES
Average per week



6 Community Gardens
AT NORTH CAMPUS, SOUTH CAMPUS,
CAMPUS SAINT-JEAN AND AUGUSTANA
2016-17

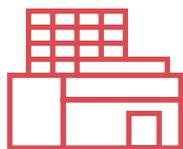


31% Food Purchases
LOCAL, COMMUNITY-BASED OR
CERTIFIED ETHICALLY-SOURCED
Dining Services

CLIMATE CHANGE



Physical Activity & Wellness Centre
90 KW SOLAR-THERMAL
22 KW PHOTOVOLTAIC



Jeanne and Peter Lougheed Performing Arts Centre
157 KW PHOTOVOLTAIC

2005-06 GHG emissions

2012-13 GHG emissions

2020 GHG emissions goal

Reduce greenhouse gas emissions by 17% below 2005 levels
BY 2020



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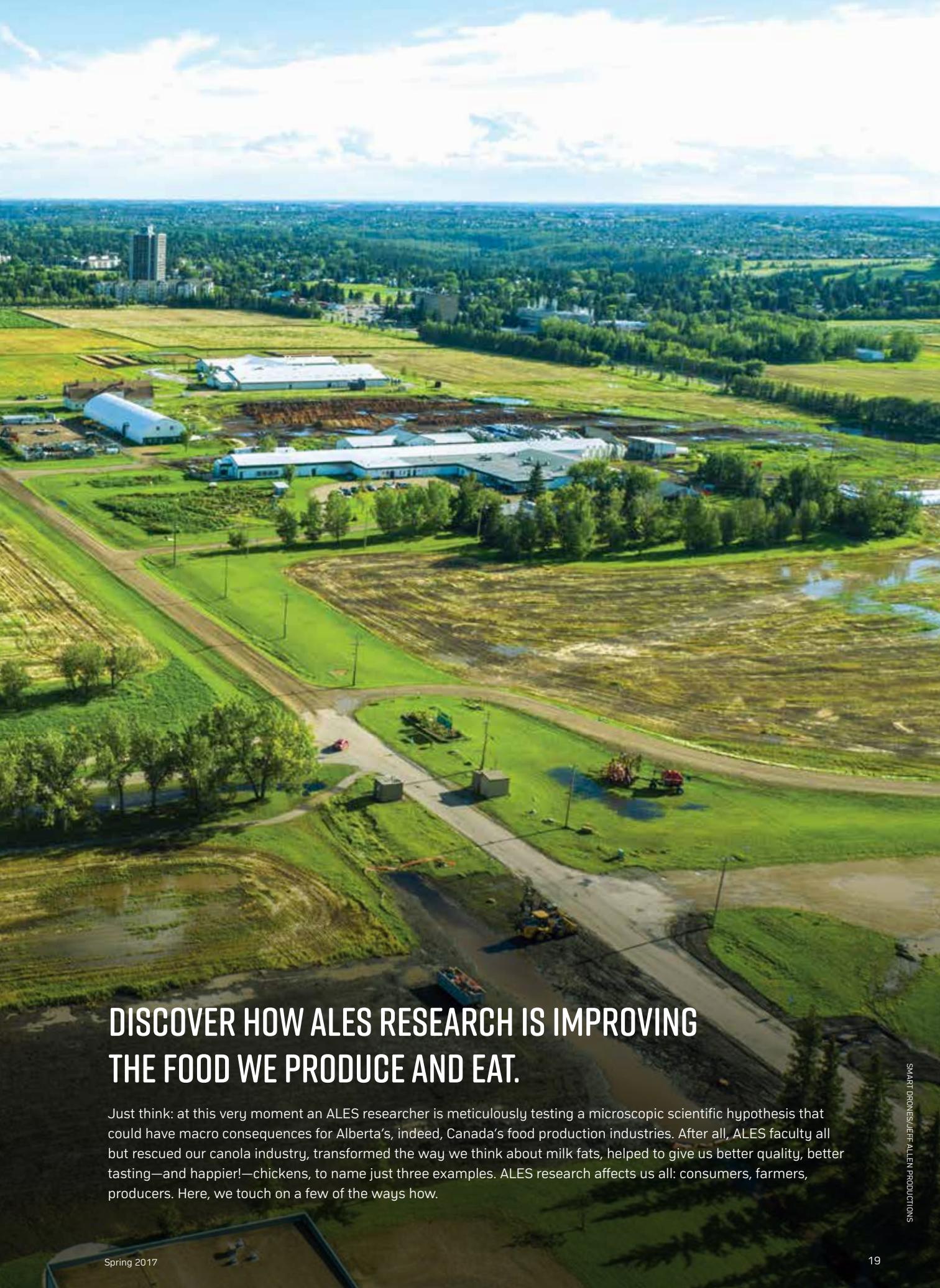


UNIVERSITY OF ALBERTA
FACULTY OF AGRICULTURAL,
LIFE & ENVIRONMENTAL SCIENCES



HOW OUR AG LAB AFFECTS THE FOOD YOU EAT

BY LESLEY YOUNG



DISCOVER HOW ALES RESEARCH IS IMPROVING THE FOOD WE PRODUCE AND EAT.

Just think: at this very moment an ALES researcher is meticulously testing a microscopic scientific hypothesis that could have macro consequences for Alberta's, indeed, Canada's food production industries. After all, ALES faculty all but rescued our canola industry, transformed the way we think about milk fats, helped to give us better quality, better tasting—and happier!—chickens, to name just three examples. ALES research affects us all: consumers, farmers, producers. Here, we touch on a few of the ways how.

SMART DRONES/JEFF ALLEN PRODUCTIONS



POULTRY RESEARCH CENTRE (PRC)

Located on South Campus, the PRC was founded in 1986 and since then has responded dynamically to industry needs while meeting our increasing demand for chicken, according to Karen Kirkwood, executive director of Alberta Chicken Producers. “In the past year, we grew 138 million live kilograms of meat or about \$275 million in farm cash receipts in Alberta,” she says. That’s a lot of roast chicken dinner.

And chicken nuggets. Kirkwood cites PRC assistance with the development of a producer animal care certification program and its formidable research to establish best management practices for antibiotic use. Here are a few of its latest ongoing contributions.

LESS HUNGRY CHICKENS

Over the past 50 years, genetic selection for desirable traits in chickens has increased broiler breeder

body weight 4.5 times and doubled feed conversion efficiency. And while bigger chickens eating less saves farmers money, and ensures steady pricing, there’s always a trade-off. For the past 30 years, PRC researchers, like Martin Zuidhof, have been tackling how to offset the production efficiency toll on poultry reproductive rates. He’s hoping his Precision Broiler Breeder Feeding System—a feeding station where birds step up, are weighed and fed appropriately—will give each bird the right



amount of food at the right time.

Potential impacts include:

- Happy chickens: Bigger birds will no longer go hungry thanks to more frequent meals throughout the day.
- Happy breeders: Alberta's 250 or so broiler breeders will enjoy a 25 per cent increase in production (145 chickens per hen from 117); better flock uniformity; and immeasurable relief from making tough daily feed allocation decisions.

- Happy consumers: We'll still enjoy decently priced, high quality chicken but we'll be comforted knowing that it is sustainably produced thanks to a 25 per cent reduction in greenhouse gas emissions from chicken production.

BETTER FLAVOUR (AND LESS WASTE)

Ever wonder about the robust flavour profile of some processed foods? Associate Professor Mirko Betti is one among several PRC researchers developing value-added benefits from chicken byproducts such as skin, ligaments and bones, which might otherwise go to waste. Using a process called hydrolysis, specific proteins from chicken byproducts are recovered, which can then be added to foods, like soup, to boost umami (savoury) taste and saltiness of foods.

REDUCED BLOOD PRESSURE

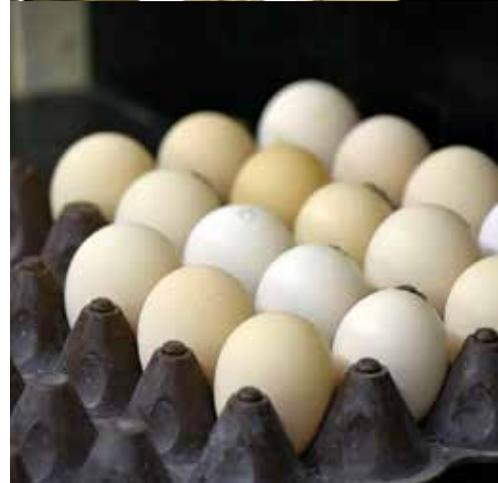
In another example of using every last component of a chicken, Professor Jianping Wu has identified three peptides in eggs that can be formulated into a therapeutic product for hypertension management.

RELIEF FROM ARTHRITIS

Another potential poultry by-product we can benefit from: Mirko Betti's discovery of bioactive sulfated polysaccharides, which can be used in over-the-counter supplements to relieve the painful disorder.

FRESH, LOCAL EGGS (AND A FEEL-GOOD BONUS)

The PRC's Adopt a Heritage Chicken Program supplies local Albertans with free-run eggs while ensuring a highly valuable bank of genes and traits in heritage hens—like disease resistance and unique egg and meat flavours—is sustained. It's an industry insurance policy and a popular one—with a 400-plus wait list!



DAIRY RESEARCH AND TECHNOLOGY CENTRE (DRTC)

It's very likely that Edmontonians have drunk milk that comes from one of the 140+ Holstein cows housed at the DRTC on South Campus. Not only do these hard-working cows produce 10,000 thousand litres of milk, safely distributed to stores every two days, research conducted on them also helps to establish ideal nutrition, weaning and vaccine practices for Alberta's 551 dairy farmers. The end result: boosted cow health, increased profit margins and a steady supply of high quality milk

to consumers—164 million four-litre jugs each year—to be precise. “Working closely with the DRTC gives producers a lot of support and faith in dealing with the challenges they face on the farm daily getting milk to consumers,” says Mike Southwood, General Manager of Alberta Milk. Here are just a few of the ways how.

HEART-HEALTHY SOURCES OF ALL-NATURAL FAT

While we don't see healthy fat claims on dairy products in Canada



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yet, that's something we could see in the future thanks in large part to work by dairy researcher John Kennelly (also former dean of ALES). Remember the backlash against butter in the 1980s? His team's work into the composition of milk fats showed just how healthy a few of its 400 different fatty acids are—namely, conjugated linoleic acid (CLA)'s anti-carcinogenic attributes. Then, remember the anti-trans fats crusade in 2000? ALES' Spencer Proctor helped to show how dairy's naturally occurring trans fats are not



the same as the trans fats produced in processed foods. Without the work done by DRTC researchers, consumers might have cut back on what is in fact a very healthy source of fat in their diets, says Southwood. The good news: “We’re seeing a switch in consumers drinking milk going from skim and 1% to 2% and whole milk,” he adds.

HEALTHY CALVES

Collectively, DRTC researchers, including Michael Steele and Divakar Ambrose, have achieved huge

advances in the way calves are fed, not just optimizing efficiency and reducing costs for farmers over the past five years, but also making advances in animal welfare. For example, discoveries in improving gut microbiology through feed nutrition not only saves calves lives (usually 10 per cent die) but reduces the number who get sick and need antibiotics early in life (up to 50 per cent). Meanwhile, nutritional immunologist Burim Ametaj has identified biomarkers to identify six diseases—metritis,

mastitis, laminitis, ketosis, milk fever and retained placenta—two months before calving and two months after birth, to predict which cows might be at risk. If further tests prove successful, it could help dairy farmers significantly reduce their need to cull their herd. “There’s a lot of misconceptions about how dairy cows are treated,” says Southwood. “ALES research, whether it’s on feed or vaccines, is helping to ensure we have healthy calves right through to cows.”



ALL IMAGES BRIAN KLEIN

CROP LAND AND RESOURCE UNIT

When it comes to breeding that literally saves the day, the Crop Land and Resource Unit or CLRU (also located on South Campus) gets gold. Its research breakthroughs have ensured canola farmers continue to produce billions of dollars every year courtesy of higher yielding crops that don't require excessive use of pesticides, and have helped keep Alberta on top of the world wheat stage by producing new, hearty varieties. "Producers really rely on agronomic researchers and breeders like those at the Crop Unit every day," says Lauren Comin, Research Manager at Alberta Wheat Commission. Here are a few ways how.

SAVING OUR CANOLA INDUSTRY

Back in the late 80s and 90s, blackleg disease threatened to end Alberta's canola crops. ALES Gary Stringham came up with a disease resistance variety. Now the scary threat is clubroot and Habibur Rahman's is helping ensure farmers get ahead of the scourge, says Clinton Jurke,

Agronomy Director at the Canola Council of Canada. "Without the U of A's work, I am sure clubroot would be a much bigger threat," he adds. It might also have cost the economy dearly: canola is Canada's largest cash crop and contributes \$19.3 billion to the economy. "For many prairie farmers, it's the most profitable crop they grow," adds Jurke.

HEALTHIER DEEP-FRIED FOODS

Yes, you read right. Ongoing research by Rahman that will increase the oleic acid in canola oil by five per cent could result in a much stabler oil to cook, which translates into less trans fats in those french fries.

HELP FROM ST. ALBERT

Just north of St. Albert, work at the 800-acre St. Albert Research Station is supporting CLRU's endeavours including the quest for breeding a better tasting canola oil and searching for ways to continue to mitigate wheat's high protein breeding toll on production. "For consumers, that means making sure they get the same

nutritional value in wheat for a low cost," explains Barry Irving, manager of ALES' research stations.

MAKING ALBERTA A WHEAT POWERHOUSE

Wheat farming's tough in Alberta. From constantly changing environments (wet versus dry seasons) to the threat of new diseases, there are bumps in yield and pressure to grow more on less land, says Comin. She adds that farmers' desire to grow sustainably is greatly helped by Dean Spaner—one of just nine wheat breeders in western Canada who spends years growing new wheat varieties that will thrive. Recently, several new wheat varieties made it through the rigorous approval process—mainly Western Red Spring wheats, which matures early, requires less water and chemical spraying to fend off disease and make yeast breads bake so well. Not only will farmers benefit from having options, Alberta's WRS wheats have one of the best reputations on the international market, which is critical since three-quarters of our wheat is exported.



“WITHOUT THE
U OF A’S WORK,
I AM SURE
CLUBROOT WOULD
BE A MUCH BIGGER
THREAT.”

— CLINTON JURKE
AGRONOMY DIRECTOR
CANOLA COUNCIL OF CANADA



RANGELANDS RESEARCH INSTITUTE— MATTHEIS RANCH



Amid Alberta's sprawling prairies are 7.4 million hectares of rangelands—which include grasslands, forested, riparian and tame pastures. And while rangelands are roughly 43 per cent of our agriculture base, they are one of the most threatened ecosystems in Canada. But why should we care? Because research conducted at the Rangelands Research Institute (RRI) on the Mattheis Ranch, a 12,300-acre ranchland research unit near Duchess, 150 km east of Calgary,

highlights the importance of native grasslands in retaining soil's organic carbon and conserving soil health, "particularly in relation to areas converted to more intensive land uses such as annual crop production," says Edward Bork, professor and Mattheis Chair in Rangeland Ecology and management and the director of the RRI. Researchers have also determined that the ongoing presence of low to moderate rates of livestock grazing on Alberta

grasslands is compatible with maintaining rangeland function. "And in select regions," Bork adds, "it leads to increased plant diversity and biomass production." In other words, it's establishing a symbiotic relationship between humans and the planet. Here's how.

CARBON REDUCTION AND OFFSETTING CLIMATE CHANGE

Research by ALES' Cameron Carlyle shows that Alberta's grasslands provide a massive value beyond



SUPPLIED



MICHEL PROULX



MICHEL PROULX

wild forage for cattle and indigenous species: it's a crucial storer of carbon. "With the right type of grazing management system, we can encourage carbon sequestering from the atmosphere into the soil and reduce carbon dioxide and effect climate change," says Carlyle. This research will also help cattle producers be better informed to mitigate effects of drought.

SUSTAINABLY PRODUCED BEEF
The RRI's Beef and Biodiversity

project is helping ensure we get one of our top food demands—sustainably produced meat—thanks to research-based grazing management practices that support a better relationship between cattle production and preserving biodiversity of grasslands. Fawn Jackson, Executive Director of the Canadian Roundtable on Sustainable Beef, says consumers want to know the food we're eating is being raised in ways that align with our personal values, including

environmental stewardship. She adds that the Roundtable's goal is to help make it clearer to the public which beef is sustainably grown, and research like that at the Mattheis Ranch is helpful. "We know the relationship between beef and conservation of grasslands is complex. Biodiversity is one principle of sustainably produced beef. The more we know about it the better able the beef industry is to give consumers what they want."



AGRI-FOOD DISCOVERY PLACE (AFDP)

Before agri-innovations by researchers such as those at ALES reach our tables, they must be piloted. However, transforming lab findings into consumable products often hinges on access to expensive equipment. Enter the unique AFDP state-of-the-art facilities located on South Campus: take a tour and you'll be wowed by 2,000-litre fermentors (where a researcher might be refining a probiotic in animal feed) or surprised

by 7,400 sq. ft. biosafety meat processing facility. In fact, the ADFP's Solvent Processing Area and Meat and Safety Processing capabilities make it the only pilot plant in Canada that works in the specialty niche of supporting specialized testing and scale up of volume products sufficient for clinical and field trials, says Bob Rimes, AFDP's executive director. Bottom line: AFDP is a "one-stop shopping" setting where researchers, industry, equipment developers,

technologists and government can fine tune the value-added processing and bio-refining of agriculture foods and products, as well as investigate food safety. Here are just a few of the neat bench or pen-to-grocery-store-shelf projects that are underway.

SATISFIED PETS

One of Alberta's pet food companies uses AFDP to produce a new kibble formulation every year. Because AFDP's extruder is 90 per



cent scalable to the company's commercial plant, the new product hits the market in a timely fashion—keeping Fido satisfied.

INNOVATIVE NATURAL HEALTH PRODUCTS

AFDP is presently working with a well-established natural health product client on numerous products. The latest five in various stages of applied research are chemo-preventatives and anti-hypertension natural products.

HEALTHIER CHICKENS

A new start-up company has been working with AFDP to scale up culture targeting protein-based additives that fight microbial infections in broiler chickens. That means improved animal welfare and less antibiotic use.

SAFER MEAT

Food microbiologist Lynn McMullen developed a testing device, along with medical and computer science colleagues, that is more sensitive

at picking up *E. coli* strains, faster at pinpointing results and less expensive than other tests that are currently used in food processing facilities. The device, which is about the size of a shoebox, will give industry a tool to make rapid decisions on the safety of their products with a quick test that can be done in the processing facility without highly trained microbiology technical expertise. "There is potential to expand the technology to other food-borne pathogens," said McMullen.





BRIAN KLEIN

SWINE RESEARCH AND TECHNICAL CENTRE (SRTC)

Like most agricultural commodity producers, Alberta's swine farmers are expected to do more with less. That's why researchers at SRTC's "the pig barn"—located on South Campus—have made major strides in understanding swine biology. The goal is to identify how best to take care of the 1.5 million pigs on Alberta farms, and the results have been profound in terms of boosting nutrition and metabolism and meat quality, as well as efficiency in reproduction, growth genetics and animal welfare, says swine researcher Michael Dyck.

BOOSTED NATURAL IMMUNITY

Dyck's leading the next phase of research originally conducted at Roy Berg Kinsella Research Ranch that identified genetic markers of swine that have fewer illnesses and bounce back from sickness quicker. "Now we're trying to identify genetic profiles in animals that are

resilient to specific diseases like PRRS [Porcine Reproductive & Respiratory Syndrome] and still maintain growth rates," explains Dyck. Breeding stronger pigs will cut back on farm losses, reduce use of antibiotics, and, of course, elevate overall animal well-being. This is really important because research shows one of the drivers of declining pork consumption in Canada is concern over animal welfare.

BETTER QUALITY PORK

Professor Ruurd Zijlstra's research into the right combination of amino acids in pig feed, especially during pregnancy, not only leads to a healthier breeding stock but a more efficient animal (read: lower costs to produce). "If producers know exactly what to put in diets at different stages of development, then they are not wasting money on ingredients that aren't being used," explains Dyck. At the same time, because diet impacts muscle, care is being given to ensure quality tasting pork.





suppleus

ROY BERG KINSELLA RESEARCH RANCH

Each of the approximate 850 head of cattle on the Kinsella Ranch—5,000 hectares located within the central parkland of Alberta—are genetically sequenced. No surprise considering the work of its namesake, ALES' Roy Berg: his 30 years of cross-breeding research increased the productivity of cattle lines by up to 40 percent. Today, Kinsella researchers, via Livestock Gentec, helped to develop the tool that allowed the mapping of 25,000 to 30,000 genes in beef (and other livestock, too), and are now focusing on ones that will impact industry and consumers the most such as growth rate, feed efficiency and meat quality, says Graham Plastow, Livestock Gentec's CEO. "We're really at the leading edge of technology here," he says. Genomic selection discoveries should not be underestimated: the Canadian Dairy Network reports annual saving of \$236 million thanks to being able to identify the genetic potential of animals very early on in life; meanwhile genomic predictors for feed efficiency are accurate by up

to 60 per cent for different livestock populations. Here are just a few other neat projects underway at Kinsella.

'GREENER' COWS

Methane emissions from cattle are strongly connected to feed intake: researchers are using lasers and breathalyzers—a tool that measures animal belches—to determine how feed changes (and genetic selection) could reduce greenhouse gas emissions by 10 to 20 per cent, and supply us with beef that has a much smaller carbon footprint.

PRODUCING DELECTABLE (AND SAFE) BEEF

ALES researcher Heather Bruce is constantly searching for ways to make meat taste better, and ensuring food safety.

- **No more slaughtering in vain:** The problem of dark cutting (abnormal colour, tenderness and taste versus the bright red we see on the meat shelf) has long vexed producers. Bruce and her team are looking at ways of managing

animals differently—including how to reduce stress (read: happier cattle!)—to ensure more quality meat and prevent the slaughtering of animals that won't be ultimately consumed.

- **Instant tenderness screening:** With beef so expensive these days, it would be nice to be guaranteed a tender cut every time (regardless of cooking skills!). Bruce's team is working on an infrared technology that will gauge toughness versus tenderness at the meat counter. "Eventually we could use this technology for other species," she says.
- **Preventing meat recalls:** With the average age of meat industry producers at 50, there's a real safety risk of unqualified people handling beef. ALES is home to the Meat Education and Training Network—Canada's first meat science graduate program. "Hopefully in the future, there will be no massive meat recalls as these young highly qualified people roll out into the industry." ■

THE TRUTH ABOUT GMOS

BY CAROLINE BARLOTT

Despite the widespread distrust of genetically modified organisms in our food, science shows us they are safe.

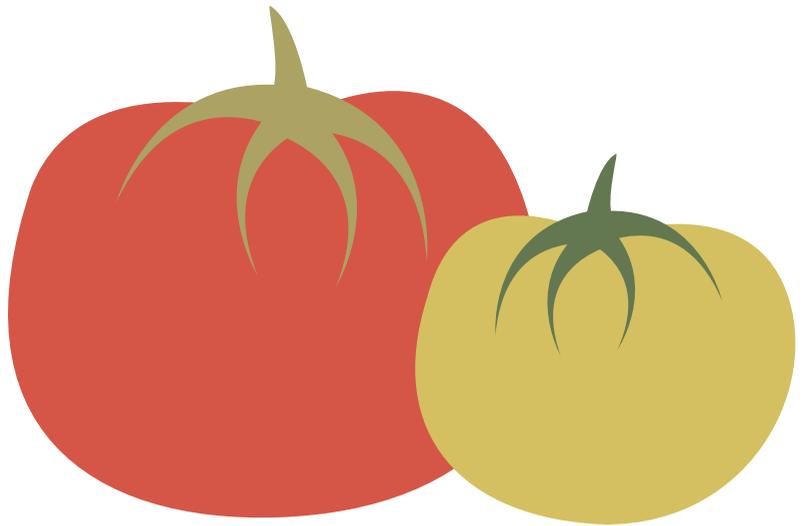
It's a scene that has unfolded in hundreds of cities around the world. Protestors wearing t-shirts emblazoned with GMO, OMG, WTF, march in downtown streets while others carry brightly coloured signs saying: "Our Right to know, Label GMO." In one Canadian city last year, one man used a loud speaker to express his message—just say no to Monsanto—before the group made its way to a GMO-free farmers market and festival. The event, March Against Monsanto, encouraged people to express their fear and anger towards genetically modified organisms (GMOs).

When it comes to GMOs, public opinion generally stands in opposition to the scientists who develop the technologies in the lab. "There are no documented cases of people getting sick as a direct result of eating foods containing genetically engineered products," says **Henry An**, an ALES agricultural economist. And according to a study by the American Association for the Advancement of Science, 88 per cent of scientists believe that GMOs are generally safe, compared to only 37 per cent of the general population.

Many attribute the public's belief to a suspicion of the science but it's more than that; it's also a wariness of the big companies behind it. This distrust has fueled many global non-profits and citizens to push for mandatory labelling of GMO products, resulting in 64 countries putting laws into effect. Canada is not one of them despite a Health Canada report that says 78 per cent of Canadians would like to know if they are consuming GMOs. But An says public perception was different at the beginning.

HOW IT ALL BEGAN

In 1994, the Flavr Savr, the first GMO product on the market, was a tomato that could be picked for sale when ripe, a remarkable feat considering mass produced tomatoes are usually harvested green to avoid bruising,



and ripened using ethylene gas. At the time, people's minds were free of any associations with big companies and GMOs. The tomato was being marketed by a small group of scientists—self-described gene jockeys going by the company name Calgene—with no commercial or industrial background.

An explains that what we think of as genetically modified organisms nowadays are actually genetically engineered organisms. "Genetically modified just means that the underlying genome has been changed somehow, which is pretty much everything we eat. Genetic engineering is this precise attempt to alter the DNA using modern molecular biology techniques," says An.

In the case of the Flavr Savr tomato, scientists turned off the tomato gene that would make it get soft, allowing it to ripen slowly over several weeks. And when it was released in Davis, California—a town where most people rode bikes and bought organic food at one of the best farmers markets in the state—the tomato was mostly embraced by the public, according to An.

The company even proudly labelled the fruit as a GMO to distinguish it from regular tomatoes but the business side of things eventually proved too much for the scientists who eventually sold their company to behemoth Monsanto. The company scrapped the genetically engineered tomato in 1998 when it didn't quite work as well as expected.

THE TIDE SHIFTS

In the 1980s, Monsanto reincorporated with an agricultural focus, particularly GMOs—and in the early to mid-1990s, it was looking to introduce Europe to genetically engineered foods. But the introduction happened after an outbreak of mad cow disease in the U.K., where the government had assured residents that the illness would not affect humans. They were wrong, and now the British were leery of their food being changed in a way few understood. Activists even pulled crops out of the ground in protest.

Many non-profits including Greenpeace and Friends of the Earth joined the successfully growing anti-GMO movement, especially targeting Monsanto's Round Up Ready crops despite the fact it doesn't have any herbicide built into the seed, illustrating an obvious lack of trust in one of the big GMO players. Several companies including Syngenta, DuPont Biotechnology and Bayer (which is in the process of merging with Monsanto) produce GMO crops, but Monsanto tends to be the poster-child for all things genetically modified.

"Is Monsanto trustworthy? They are in the sense that they provide their shareholders with profitable returns. Are they trustworthy to be ethical or moral in providing safe products to consumers? Not in my opinion," says John Schneider, owner of Gold Forest Grains, a company that produces heritage grains.

People worried about long-term health problems, about the environment and about large companies valuing profit margins over anything else. Monsanto enforced its patents and sued farmers when they planted the next generation of the seeds, which the farmers weren't supposed to do. Regardless, the perception was that Monsanto was the antithesis to Calgene, the developers of the Flavr Savr, who were adamant about being transparent in the science and their business practices. Monsanto's strategy and business practices led to people further questioning the intentions of an industry that they already distrusted.

Parts of the European Union and Asia called for the ban of certain GM products. While India strictly avoided GMOs, it passed GM cotton production in 2002 and many farmers converted to the new technology. Genetically modified corn, soy beans, and canola crops were developed and used in many parts of the world while the technology to produce other plants—some higher in nutritional value than conventional plants—exists on laboratory shelves, waiting for industry backing in some cases, approval for use in others.

THE PUSH TOWARDS LABELLING

This distrust fueled the flames of a strong push towards labelling, propelled by non-profits and citizens alike. Campbell's Soup, the first major company to begin labelling its products as containing GMO ingredients, has stated it doesn't plan to increase costs—one of the original criticisms of labelling.

"GM foods need labelling because the public's trust of industry has eroded to the point where we don't care what they have to say," says Schneider. "It should be labelled so that folks who trust industry and GM technology can seek it out. Those of us who do not, can avoid it. It really doesn't get simpler than that."

To An, the problem is far from simple. Providing a label, he says, will not provide people with the information they need to make informed decisions. Labels cannot provide nuance, and there is plenty of nuance when it comes to GMOs. An thinks a label will act as an inadvertent warning to customers about dangers that are not actually

present in the food, while distracting from actual health concerns such as lack of nutrition.

"I think it will confuse people. I think it will definitely push consumers away from GM foods, and not because it's worse, but just because it's different and they're worried," says An.

According to a recent report commissioned by Health Canada, 62 per cent of participants said they would buy a non-GM food over a GM product either due to potential environment impacts or health concerns. The research, however, also showed a lack of understanding of the science behind GM products; many participants incorrectly believed GMOs are contaminated with unknown toxins including preservatives or hormone injections.

GMOs are not contaminated, though some crops may be sprayed with herbicides or chemicals by farmers while the plants are growing. But non-GMO alternatives may also have been sprayed—so buying a non-GMO alternative does not mean a consumer is getting an organic product. In some cases, GM crops have actually

"[The public] doesn't like the fact that scientists are meddling with their food's DNA. There's an ick factor; there's a phobia associated with it."

— Henry An
ALES Agricultural
Economist



encountered fewer chemicals; and, of course, non-GMO products could be far less healthy in many other ways. Just because you're eating non-GMO potato chips does not mean it's a healthy snack made from potatoes that have never been sprayed.

"Let's say I slap a label on some food that says it contains dihydrogen oxide; excessive consumption of dihydrogen oxide has been shown to cause death. That's completely true. But it's also garbage; it's water, and yes, you can drown. It's not useful, it's misleading," says An.

The Health Canada report says there is an "information void" when it comes to GM products, and that anti-GMO advocates have been able to fill that void. **Ellen Goddard**, an ALES food economist, agrees, saying biotech companies and scientists have failed to provide transparency and clarity of information. "I think it's time that we recognize that the public thinks they're a stakeholder in the food system. We need to recognize that the public feels more strongly about that, and we need to include them more seriously," says Goddard.

GOING BACK IN TIME

Genetic modification has been around in one way or another for probably about 10,000 years, according to An, since humans started farming. "I read an article this weekend talking about how current produce varieties look in their wild form. Bananas are just full of seeds, and corn is barely edible," he says.

Humans have bred novel species of plants for centuries, and as early as the '50s, scientists started researching with chemical and radiation mutagenesis. Mutagenesis leads to random mutations, most of which are not useful, but occasionally, one of these mutations leads to a desired result. Genetic engineering is far more controversial than mutagenesis, but ironically, also far more precise. GE technology may involve transferring DNA from one organism and inserting it into another, often through the use of bacteria. Unlike random mutagenesis, the DNA inserted into the crop creates only one or a few targeted trait modifications. There are also modern methods of genome editing, such as CRISPR technology, whereby

biotechnologists can make incredibly precise changes to existing plant DNA without introducing anything foreign.

"[The public] doesn't like the fact that scientists are meddling with their food's DNA. There's an ick factor; there's a phobia associated with it," says An.

When people hear about scientists inserting fish genes into tomatoes, for example—a failed project by biotechnology pioneering company DNA Plant Technology—there is often a very real and instant negative emotional reaction. But, the idea that inserting genes from one species into another is unnatural is not true. Different species already have genes from many different types of DNA so a single gene cannot really be thought of as belonging to one specific species. Thanks to evolution, different plants and animals share many similar genes, which is why studying other species has proven beneficial to understanding human health.

Just last year, scientists discovered the presence of *Agrobacterium* genes—the same bacteria often used to create genetically engineered

GENETICALLY ENGINEERED PLANTS OR PRODUCTS?

While there are only four genetically engineered crops that grow in Canada—canola, corn, soy and sugar beets—many food products may contain one of these. Here are some examples:

Corn cereals, corn chips, cornstarch, corn oil, glucose, fructose, canola oil, soy oil, soy protein, soy lecithin, tofu, soy beverages, soy puddings, breads and baked goods, baby formulas, candy, chocolate, sweeteners, condiments, oils, dressings, spreads, spices or herbs (with corn or soy derivatives), meat and eggs (some animals are fed with GMO feed), packaged frozen meals, pet products, soups, sauces.

THE GMO PROCESS:

Step 1: DNA or RNA is isolated from the appropriate organism. DNA is isolated if the source organism is one with a simple genetic makeup like a bacterium and RNA from a more complex organism such as another plant.

Step 2: Cloning: Scientists either precisely excise a specific gene from the DNA or synthesize a DNA version specifying a specific gene from the RNA. Numerous copies of the isolated or synthesized DNA of interest is made in the laboratory and cloned.

Step 3: Once necessary modifications are made in the lab to the DNA molecule, i.e., the gene, for the desired trait to be expressed in the target plant, the gene is introduced into the plant. For example, Monsanto's MON 810 GM corn has a gene that comes from

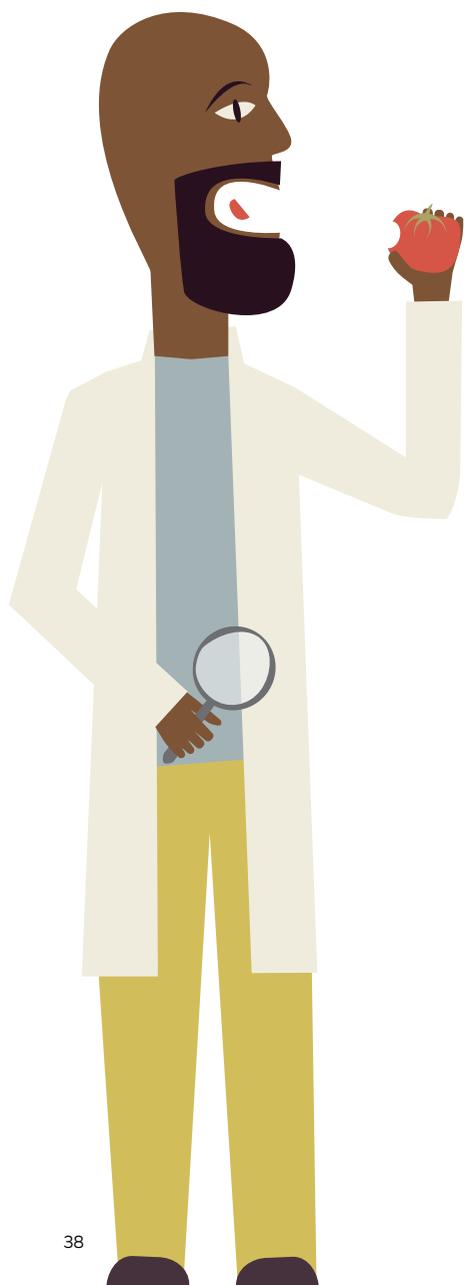
Bacillus thuringiensis, a soil bacterium, that produces a protein which affords protection against the corn borer, a common pest.

Step 4: Transgenic plants are then bred traditionally with elite lines so that the final result will be a plant possessing the trait of the new transgene, along with the high yield of the current hybrid. Alternatively, the desired gene can be introduced directly into an elite line, considerably minimizing time required to generate an elite variety with a desired trait.

Step 5: In Canada, these plants are subject to regulation by federal agencies to ensure plants with novel traits are not substantially different from what is currently cultivated for traits other than what was just introduced (e.g., resistance to insect pests).

food—occurring naturally in a sweet potato. It's proof that gene flow, the transfer of genes from one species to another, sometimes happens without human intervention.

Scientists acknowledge, however, the importance of regulation and testing in genetic engineering. There are concerns about the environmental effects of the widespread use of GM crops leading to unintended consequences. In some cases, other plants, weeds, in the same fields or in surrounding ones as genetically engineered crops, have developed the same resistance to herbicides engineered in the planted crops.



THE IMPLICATIONS IN THE DEVELOPING WORLD

Goddard believes that many people do not realize the amount of care that goes into ensuring these plants are safe. But it's not that misunderstanding that makes her voice rise in agitation; it's the socio-economic implications of not accepting GM crops.

"There's an ethical dilemma that is starting to be written about more—that the opposition that we generate in rich countries against GM technology may be part of the reason they do not get adopted in developing countries where they could materially improve human health," she says.

Golden rice is a genetically engineered crop that's infused with Vitamin A and has been touted as a potential way of preventing blindness and even death in parts of the world with vitamin deficiencies. However, while the technology exists, no country has adopted it. GMO opponents see golden rice as a Band-Aid solution with potential dangers lurking in the form of dependence on the rice, and a potential loss of knowledge of other sources of Vitamin A down the road.

"It is dishonest to say that we are helping the developing world with their Vitamin A deficiency by introducing a crop that is proprietary in nature and further controls a food supply. How about dealing with the actual problem instead of making stuff up that we need to 'fix,'" says Schneider.

ALES plant biotechnologist **Nat Kav** disagrees. He says there are several patents that cover golden rice technology and that every one of the patent owners has agreed to provide the technology free of charge to developers, without levying royalties, if the rice is used for humanitarian purposes.

Kav adds that the issues surrounding GMO introduction around the world—especially in developing

countries—are vast and complicated from social, commercial and economic standpoints. In India, he explains, there are traditional farmers who cultivate crops using seeds that their ancestors have developed over multiple generations that grow well in local conditions. "So, if I was a company, and I walked in there, and used that genetic material to isolate the DNA that is conferring those traits and introduce it in a commercial variety and make a profit—what does that farmer get that has selected that germ plasm?" questions Kav.

It's an issue that goes back to the public's suspicion of big companies and their motives—while there may be value in that suspicion, Kav says we need to be careful that we don't cut off the technologies before they have a chance to help people. Instead, he believes legislators need to continually address issues that arise to ensure exploitation doesn't happen.

"I personally believe that genetic engineering is a tool for benefitting human kind, and should certainly be used that way," says Kav. And he sees those benefits especially playing out now that climate change is causing challenges with temperature changes, drought, and disease. There are also issues resulting from needing to feed a growing population, he says.

Phytola, led by agricultural biotechnology researcher **Randall Weselake**, has developed canola plants that can produce more oil than conventional plants. They've also created flax oil that replicates the health benefits of fish oil; in fact, the health implications were so powerful, a U of A study with the oil showed reduced tumour growth in mice. And the environmental benefits are also promising. "This gets around the toxins in the fish and gets around the depleting of fish stocks due to overfishing," says Weselake.

While many GMO technologies exist beyond herbicide-resistant canola or corn—many of which have great health benefit for consumers—most of these technologies are not yet on the market. In some cases, it may be a result of companies not wanting to go against people's perceptions of the technology. A prime example would be the Simplot Co. Innate potato, a vegetable that's been genetically engineered to bruise less and contain less of the chemical acrylamide, which occurs naturally in spuds and is a carcinogen when fried.

On the surface, the potato would be a boon to companies like McDonalds and Frito-Lay; it would make for a healthier end product and even be economically and environmentally beneficial since the lack of bruising would mean less waste. But both companies refused to use them even though some of their other products contain genetic engineering, which is largely found in processed foods in the form of corn and soy. The Simplot case, though, was highly publicized, and advocacy group Food & Water Watch submitted a petition signed by 90,000 individuals asking McDonalds to reject the potato. While neither company made it clear why they made their decision, there were obvious pressures to listen to consumers. Goddard believes their approach simply fuels the flames of public distrust.

The idea that big companies are going against GMOs because they're worried about their bottom dollar is ironic—it's the very attitude that many people perceive with disgust in corporate GMO giants. "So, now we're all playing this game," says Goddard.

People often say that scientists will need to be held accountable if we find out that GMOs pose a human health risk, she says. "But what happens in five years when they say, 'Oops, we should have been using this potato all along?'" ■

RISKS AND REWARDS OF GM CANOLA

BY LINDA HALL

More than 90 per cent of the deep, rich yellow fields common on Alberta's landscape during the summer months are made up of canola that has been genetically engineered to be herbicide-resistant.

Indeed, Alberta has grown GM canola for more than 20 years. While it provides significant advantages for producers by enhancing weed control, growing genetically modified canola has also posed its share of challenges.

While GM foods pose no significant risk to the food or the environment, Canadian canola cannot be sold to markets that do not accept GMOs, limiting access to European and other markets. Furthermore, canola is an outcrossing species, which means there is considerable GM gene movement between canola fields. Contamination of GM canola has resulted in significant constraints to seed growers and organic growers.

Another common issue is that herbicide-resistant canola seed lost at harvest becomes herbicide resistant 'volunteers' that are difficult to control. These volunteers have increased herbicide use in the crops that follow canola in rotation.

The repeated use of glyphosate (Roundup) on herbicide-resistant GM crops and elsewhere has resulted in the selection of glyphosate-resistant weeds. Herbicide resistant weeds are becoming difficult to control with chemicals and may require the re-introduction of tillage that would be a step backwards in conservation agriculture.

Linda Hall is an ALES agronomist and weed scientist who conducts research on the environmental impact of transgenic crops.





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Graphic novel from PhD thesis instigates change

BY HELEN METELLA

Patti LaBoucane-Benson was giving a presentation of *The Outside Circle*, a graphic novel she wrote about two Aboriginal brothers' heartbreaking entanglement with inner-city gang life and the role that historic trauma plays in such tales, to a classroom of pre-teen students in High River.

"No less than 10 Indigenous boys, all of them resistant readers, knew everything there was to know about the story and had incredibly insightful, intelligent questions for us," she said.

They wanted to know more about why so many Aboriginal families struggle with poverty and hopelessness that often leads to crime. They had queries about Canada's infamous Sixties Scoop, when thousands of First Nations, Inuit and Métis children were snatched from their homes and placed in foster or adoptive families between the 1960s and late 1980s. They were curious about exactly how young, male Native offenders are learning to overcome the repercussions of their ancestral history at the Stan Daniels Healing Centre in Edmonton.

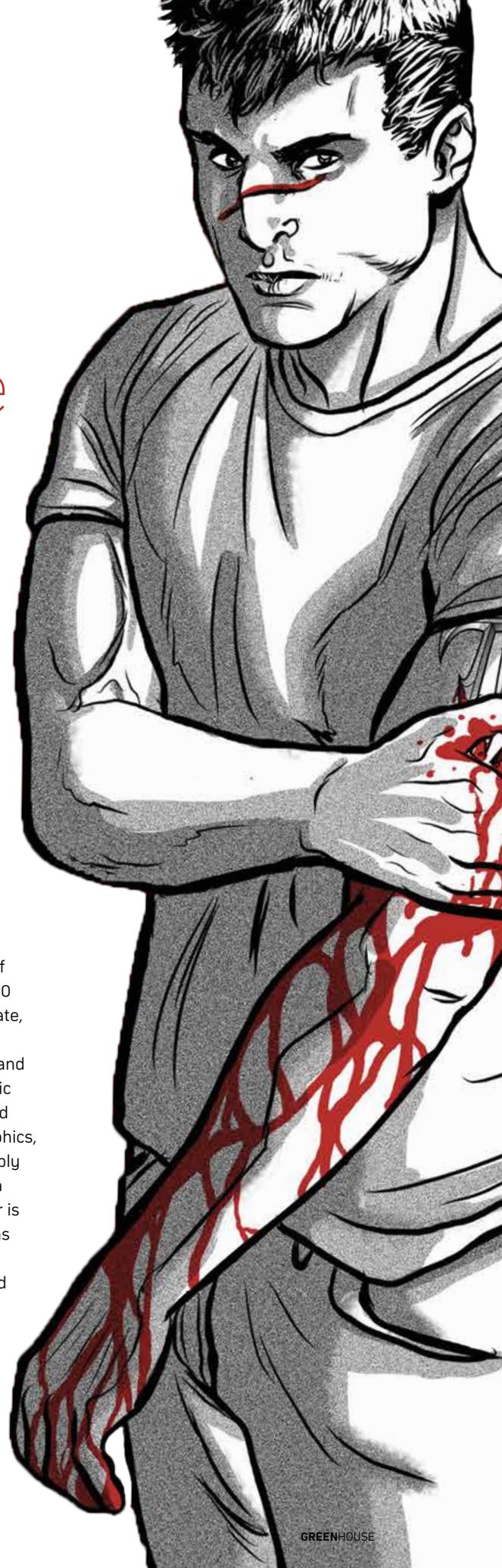
Each of those events and places figure prominently in the graphic novel, which LaBoucane-Benson—who earned a PhD in Human Ecology in 2009—wrote to share the

findings of her graduate thesis about Aboriginal, family and community resilience.

Among her major conclusions: find ways to build back a positive sense of Aboriginal identity, reconcile damaged relationships and create an environment in which Indigenous boys can self-direct their healing.

By weaving her results into a graphic novel with the help of illustrator Kelly Mellings, a 2000 UAlberta art and design graduate, she targeted an audience who may never pick up a textbook and who is unlikely to find academic research accessible if published typically. Through its bold graphics, important information is indelibly shared. The entire wording of a Permanent Guardianship Order is clearly visible as a mother signs it; statistics tracing a boy's transformation from regular kid to gang member are distilled to terse thought-balloons that show a dense timeline on a single page.

As a longtime fan of the medium, the author knew of those powers. What surprises and





gladdens her is how much further her novel's reach has been than she anticipated.

"It started immediately," she said. "I started getting interviews, getting emails from people all over.

Book sales went up, people Googled me, wanting to talk about it. It's been taken up as a piece of curriculum.

Teachers and professors across the country are teaching it in Indigenous literature courses, in criminology courses."

Non-Canadians raved, too. The Smithsonian Asian Pacific American Centre called it "a priceless gift to those surviving this life—it's an agent of hope, it's affirming proof of possible change."

Now in its third press run, it's a national bestseller for House of Anansi Press, and has sold about 20,000 hard copies plus a healthy number of e-books.

CBC Radio named it one of the Best Books of 2015, and also one of 10 Canadian books that can change the world. The U.S. Board on Books for Young People put it on 2016's outstanding international books. It won the Red Deer Reads competition, was long-listed for Canada Reads, and was nominated for other awards from the Ontario Library Association, and the Library Services for Youth in Custody organization in the U.S. At the Glenbow Museum in Calgary, an exhibit based on the book called *Power in Pictures* runs through June 2017.

The story follows Pete, a young Aboriginal man immersed in a gang who lands in jail in for

a violent crime and then watches his younger brother's life spiral downwards as a consequence. Pete begins to rehabilitate through an in-prison program of healing guided by Aboriginal ceremonies.

For its scenes of realism and emotion, LaBoucane-Benson drew on her experience of more than 20 years working with Indigenous people (many of whom have been incarcerated), as director of research, training and communication at Native Counselling Services of Alberta.

Decades of national indifference tells her that capturing attention for a book on Native-offender healing is extraordinary. But in 2015, the Truth and Reconciliation Commission's final report stirred Canadians' conscience as they elected a prime minister who campaigned on tackling issues about native citizens, so "it was the right year," she said.

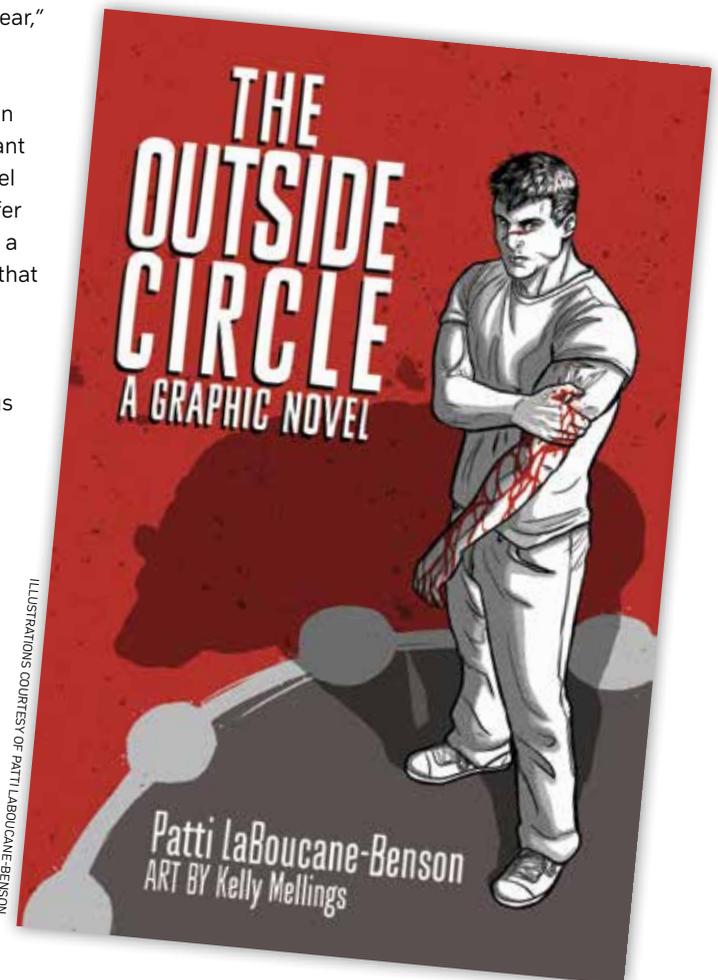
With its character-driven plot and poignant theme, the novel attracted an offer to develop it as a play, although that didn't pan out. A movie seems like a natural eventuality says LaBoucane-Benson, who is also an executive producer of

BearPaw Communications, which creates multimedia resources for clients of Native Counselling Services.

Currently, she's finishing a more academic book based on her research. "It's about what it's going to take to decrease the over-representation of Aboriginal people in the justice system, and what really needs to happen. I don't think there's a vision now."

She has a second graphic novel in mind, about women's healing, and she may update Pete's story in the future. Yet busy as she is writing "between midnight and 4 a.m.," her day job, with its component of developing historic trauma healing programs, remains as important as being an author.

"It's why we do this work. I really want to be an instigator of change." ♣



How John Calpas helped southern Alberta bloom through irrigation

BY HELEN METELLA

A big clue to why alumnus John Calpas was such a booster of irrigation and southern Alberta during his long career mentoring agricultural producers exists in his hometown of Tilley.

Many of the buildings in the tiny hamlet, which sits southeast of Brooks, on the way to Medicine Hat, were saved and moved there from Alderson, a turn-of-the-last-century boomtown 30 kilometres east. It had five hotels and “was getting ready to build an opera house before disaster struck,” said Calpas.

Alderson was wiped off the map in the 1920s, when the former breadbasket was devastated by a decade-long drought, plus plagues of gophers and grasshoppers. Now it’s a ghost town.

By contrast, in the early 1930s Tilley was developed as part of the Eastern Irrigation District, one of 13 farmer-owned-and-operated irrigation projects partially capitalized by the provincial and federal governments, and the railway. With reliable irrigation, the Calpas’s family farm thrived by growing alfalfa hay in rotations, a valuable commodity in ranch country.

“My early impression of water and its impact came in the most dramatic way, in the extreme dry desert of the driest place in the Palliser Triangle,” said Calpas, who worked on the farm until he earned a BSc in Agriculture in 1956.

The dry belt of the Palliser Triangle’s southern Alberta region spans Lethbridge to the Saskatchewan border, from north of Calgary to the U.S. and has a tragic history

concerning water. Surveyor John Palliser declared it unfit for farming in the 1860s, but in the 1870s, a government botanist argued that it received enough rain to be quite fertile. So the rail line went in and immigrant settlers created a land boom. Yet during the prolonged drought, the area lost more than half its population.

With first-hand knowledge of what irrigation did for his farm (albeit non-mechanized irrigation consisting of hand-plowed ditch-digging that is “even tiring to describe”) Calpas advocated for irrigation and special crops in the south throughout his 34 years with Alberta Agriculture.

As a district agriculturist in Taber and then a regional director in Lethbridge, he gave new settlers and war veterans advice and demonstrations on irrigation and new crop choices.

He regularly soaked up fresh information at conferences in Idaho and Washington, where irrigation and alternate crops were more advanced, and went to California for graduate work to be in the midst of commercialized irrigation agriculture and crop diversity.

All of southern Alberta’s infrastructure—including its farms, municipalities and recreational lakes—is dependent on irrigation, Calpas says.

“Without irrigation, Lethbridge would be a Drumheller,” he said, noting that despite similar beginnings in coal and railroads, Lethbridge has ten times the population.

Such enthusiasm for proof helped him promote irrigation to the media and politicians in the 1970s.



John Calpas '56 BSc (Ag) played a big role in the agricultural productivity of southern Alberta by championing irrigation and then by nurturing entrepreneurs.

“It was conventional wisdom then that that southern Alberta irrigation was a bottomless pit of subsidy,” said Calpas.

But he saw farmers paying their own way through irrigation fees and equipment. So using provincial census data, he compared costs to production and manufacturing, and deduced irrigation’s value.

“At the time, it was four per cent of the arable land in Alberta (that was irrigated) and it was producing 16 per cent of the growers’ value in agricultural production,” he said. “It’s been validated many times since as 20 per cent off five per cent, and still growing.”

Such research helped convince the minister of agriculture to create an irrigation division within Agriculture.



Calpas later became division director.

Once he'd raised awareness about irrigation, Calpas nurtured the crop diversity that emerged as a result. Alongside entrepreneurs growing dry field beans, he became a shareholder in the Island Seed company. Seeing immigrant potato farmers being paid No. 2 Grade prices for No. 1 Grade product by wholesalers, he encouraged them do their own grading, which established Packwell Produce. He and fellow district agriculturalists helped usher in canola, corn, alfalfa and many other crops.

After retiring from Alberta Agriculture, Calpas had two more careers, the first as agricultural program administrator at Lethbridge

College. There he encouraged wealthy farmer Ron Tiffin to donate more than \$1 million for an endowment. As a tribute, Calpas then established the Tiffin Conference, an annual educational event for producers and industry that draws international speakers to this day. As well, he began organizing tours between China and Alberta, to share knowledge on agricultural practices.

In 2000, Calpas became the director of information services at the Lethbridge Research Centre, and continued independent consulting and hosting groups from Europe and Australia. His last tour to China was in 2013.

Among many awards, he was named Distinguished Agrolgist by the Alberta Institute for Agrolgy, and received an International Year of Volunteers Award from the government of Canada.

Now 84, he takes great satisfaction in the tangible benefits irrigation has brought to southern Alberta.

"We helped achieve through irrigation possibly the most advanced technology on the continent. We have three potato processors, three hybrid canola seed companies, one canola oil, one corn, one alfalfa seed and on in pulse crops, grain and mustard. And it's all happening on this dry land!" ■



Out of the classroom and into the fire

Early start to wildfire season keeps Tyler Schneider on the move protecting forests and communities—including his former hometown of Fort McMurray.

BY **BRYAN ALARY**

When Tyler Schneider graduated with his BSc in forestry last spring, he didn't spend too much time celebrating. An early start to the wildfire season had the seasonal firefighter back in the forest in no time.

The new grad logged thousands of kilometres by road, on foot and through the air, jumping from one hotspot to another—including "the Beast," which burned a swath of destruction through his former hometown of Fort McMurray.

"It reminded me quite a bit of 2011 when Slave Lake burned down and Fort McMurray had a large fire close to town. Very windy," says Schneider, an eight-year veteran of fighting forest fires.

Five years ago, Schneider was on the ground helping contain that northern inferno—the Richardson

fire, which tore through 560,000 hectares of forest north of Fort McMurray. Last year, he spent 12- to 15-hour days on the fringes of the Horse River wildfire—the official name of the Fort McMurray blaze—trying to contain the spread of new fires.

FROM ONE HOTSPOT TO ANOTHER

The fire was so intense, it created its own weather, a rare phenomenon called pyrocumulonimbus that can lead to strong winds and lightning strikes—the major cause of wildfires other than human activity.

Schneider, a supervisor who is the incident commander on large wildfires, was called in to monitor and battle those lightning-caused secondary fires. That meant work on the ground and in the air in

helicopters, relaying information to Alberta Wildfire offices.

"As soon as the fire was going out, you could see it was going to blow up again. Sometimes it meant putting in a request for air tankers, telling them what you're seeing."

The fire eventually raged out of control, making it too dangerous for the crew to remain in position. Schneider and his team were soon dispatched to the main fire command centre south of the city, setting up sprinklers and water pumps that are critical to protecting important structures.

All this movement was within a 15-hour span. Schneider remained just as busy moving from one hotspot to another from areas around Conklin and Janvier immediately after classes ended to Lac La Biche to Redwater, where he spelled off the

Tyler Schneider, who has been fighting forest fires for eight years, completed his BSc in Forestry last year. He hopes to use his newly acquired skills and knowledge about forest systems to eventually work in forest management.

SUPPLIED



incident commander for a blaze that burned 250 hectares of forest.

The main difference between last year's fire season and the one before, Schneider says, is that last year's June was, thankfully, much wetter. And though the devastation to Fort McMurray was tragic for many of his friends who still call the city home, if there's a silver lining it's the public attention about how wildfires start and spread.

"Human-caused fires have dropped off significantly," he says.

RESPONDING TO THE FORT MCMURRAY CRISIS

Even when not on the front lines trudging through smoke and embers, Schneider has helped with the Fort McMurray crisis. At one point, he and his wife took in three families—friends from Fort McMurray—and

even some four-legged friends, with two dogs and a cat in addition to their own pooch in their small condo in Edmonton.

"It was a bit tight there for a while," Schneider laughs.

At home in the great outdoors, Schneider got into wildland firefighting after high school—partly at the prospect of riding shotgun in a helicopter. But over the years, he's developed a close bond with the tight-knit community of men and women who keep coming back season after season to fight wildfires

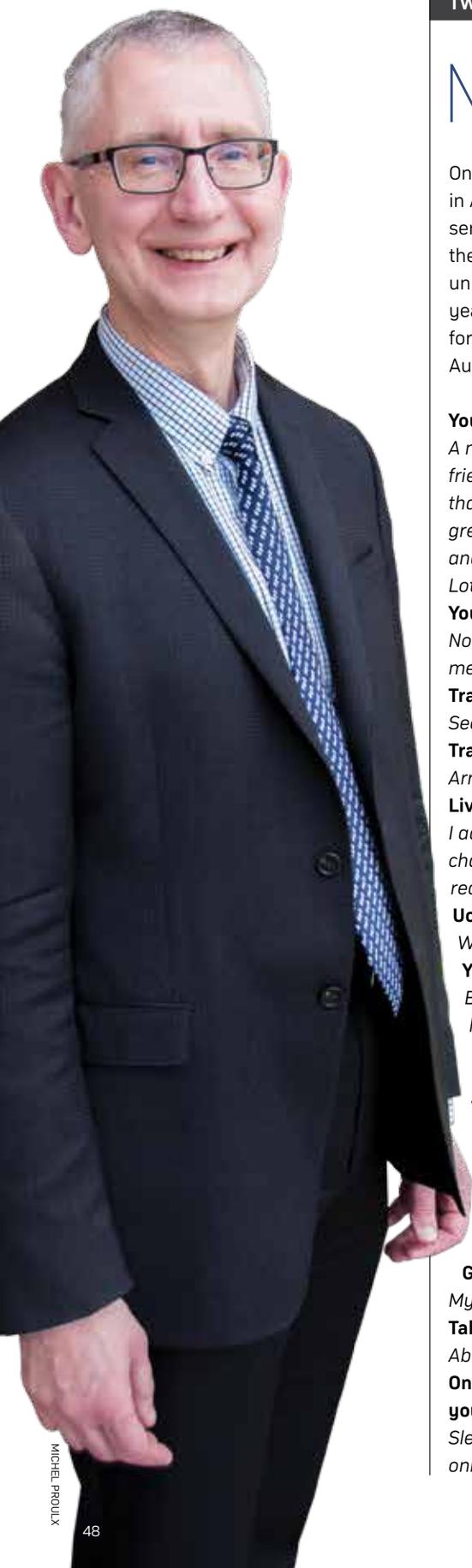
"It's a very supportive group who thrive on very exciting, challenging work," he says. "Certain personality types are attracted to it, crave the high-stress situation."

It was through his firefighting colleagues that Schneider got interested in a career in forestry.

He'd already obtained a diploma in forestry from NAIT and worked as a forestry officer near Fort McMurray for five years when his colleagues, many of them U of A forestry alumni, inspired him to reach further and get his degree.

Though firefighting has consumed the bulk of his energy since completing the program, Schneider has a few irons in the fire, so to speak. Ultimately, he'd like to work in forest management and use his new skills and knowledge about forest systems in ways that don't involve the blistering heat and acrid smoke of wildfires. In terms of a work-life balance, it doesn't get any better, he says.

"You're outdoors, not all office work. It's a small community of people and it's a natural resource industry that can be sustainable." 🍃



TWENTY QUESTIONS

Meet the vice-dean

One of the first things Dean Stan Blade did upon being named dean of the faculty in August 2014, was ask environmental economist Vic Adamowicz if he would serve as vice-dean. Adamowicz, a very well-respected academic who carries the title of Distinguished University Professor, one of the highest honours the university can bestow on a member of the academic staff, agreed to serve for two years. He said then that he accepted Dean Blade's offer because he was looking forward to work with the ALES leadership group. Upon the end of his term in August 2016, he signed on for another two years.

Your idea of perfect happiness?

A nice wine, a fine meal with family/friends. Or, having a beer along with that wonderful tired feeling after a great workout. Or, hiking with my wife and finding some new birds for the list. Lots of things make me happy.

Your greatest fear?

Not being able to be physically and mentally active.

Trait you most deplore in yourself?

Second guessing myself.

Trait you most deplore in others?

Arrogance.

Living person you most admire?

I admire many people and characteristics that they have—not really a single person.

Your greatest extravagance?

Wine.

Your current state of mind?

Barely suppressed panic (that's how my wife describes being a parent); actually I'm pretty relaxed right now, it's the weekend.

The most overrated virtue?

Ambition.

Words or phrases you most overuse?

He/She/They will figure it out, and heterogeneity.

Greatest love of your life?

My wife.

Talent would you most like to have?

Ability to hit a golf ball straight.

One thing you would change about yourself, if you could?

Sleep more/worry less (this is really only one thing).

Your most marked characteristic?

Even-keeled.

What you most value in your friends?

Being genuine.

Your heroes in real life?

I'm not a hero worshipper. I admire many people: my wife and daughters, my parents and siblings, my friends, colleagues. At some point they have all been heroes—and will continue to be.

About being vice-dean... you've signed on for another two years. What exactly does a vice-dean do?

Anything the Dean asks him to. More seriously, in addition to being part of the leadership team, I'm taking on more of the international programs in the faculty and playing a larger role in hiring/staffing and evaluation.

Is it what you expected?

Yes, but there are new things almost every week—which is something I like about the post (new opportunities to learn about things, provide opportunities for others, etc.).

The biggest surprise?

Even though I've been here for a long time, I continue to be amazed by the diversity and excellence of the Faculty. One really sees this being in the Dean's office.

Your favourite thing about it?

Working with the leadership team—it's a great group.

Your least favourite thing about it?

There never seems to be enough time to do everything that we could do, or celebrate all that we have done. ▀

Fresh food, practical menus and a healthy lifestyle

ALES nutrition researchers **Rhonda Bell** and **Cathy Chan** developed the Pure Prairie Eating Plan to make it as easy as possible for people living on the Prairies that want to eat in a healthier way. Recipes, based on the Canada Food Guide, are simple and easy to make, ingredients are easily found at your local grocery store. Here's one delicious recipe. For more, or to purchase the book, visit www.pureprairie.ca.

Minestrone with Mucho Meatballs

Ingredients:

½ slice	whole-wheat bread, crust removed
2 cups	low-sodium chicken broth
½ lb	ground beef, lean or extra-lean
¼ tsp	salt
⅛ tsp	ground pepper, divided
¾ tsp	Italian seasoning, divided
2 cloves	garlic, minced
½	large onion, chopped
½	carrot, thinly sliced
½	celery stalk, thinly sliced
⅛ tsp	chili pepper flakes (optional)
14 oz	diced tomatoes (one 398 mL can)
3¾ oz	tomato paste (half 213 mL can)
1½ cups	kale, chopped
¼ cup	whole-wheat spaghetti, broken

Directions:

Meatballs

1. Place bread in large bowl. Moisten with ¼ cup (60 mL) of the broth. Let stand for 5 minutes. Using fork, stir to form paste.
2. Add ground beef, salt, pepper, half of the Italian seasoning and half the garlic. Gently work together. Shape into about 12 1-inch (2.5 cm) balls, cover and refrigerate. *Make ahead: cover and refrigerate for 1 hour or up to 1 day.*

Soup

1. Cook onion, remaining garlic, carrot, celery, remaining Italian seasoning and chili pepper flakes (if using) in Dutch oven, stirring occasionally over medium-high heat until vegetables soften, about 5 minutes.
2. Add tomatoes, remaining chicken broth and tomato sauce; bring to boil. Drop meatballs into sauce; reduce heat, cover and simmer for 15 minutes.
3. Add kale and pasta; simmer for 10 minutes or until pasta is tender.

Serves 4 (serving size 2 cups)

Per serving: 356 kcal, 4g fat, 0.8g saturated fat, 58g carbohydrate, 8g fibre, 22g protein



IN MEMORIAM

ALES alumnus played pivotal role in getting electricity to Alberta farms

BY HELEN METELLA



SUPPLIED

The oldest alumnus in the Faculty of ALES, a person instrumental in getting hundreds of Alberta farms hooked up to electricity, died just three days short of his 99th birthday.

Gerald Heath, '43 BSc (Ag), made his professional mark during a long career with the Alberta government in the Rural Electrification, Cooperatives and Credit Union Branch. Part of his job was to help farmers navigate the regulations and understand their options so they could get power to their properties from the main line. Another part of his job was helping them get the loans to do so.

Very few farms in rural Alberta had electricity in the 1950s, said Heath's friend Jack Francis, the longtime animal technician who is now curator of the ALES Agricultural Museum.

"The agriculture department of the province encouraged farmers to form co-ops of two or more, to cut down on expenses," explained Francis.

With several farmers sharing the bill, they were able to pay for main electrical lines to be strung around multiple farms.

But someone had to explain the ins and outs and so Heath drove the length and breadth of the province, translating government policy into layman's language.

"He was on the go lots of evenings, meeting with farmers, and he'd also be at conventions, sizing up the machinery, knowing a little bit about it in case it came up at meetings," said Francis. "He did a lot of investigations."

His passionate belief in the philosophy of member-owned co-ops was forged soon after he graduated from the U of A, in the midst of the Second World War.

"He had joined an Officers Training Program but his hay fever prevented him from serving," said his daughter, Sandra. Francis thinks he might also have been exempted, just as numerous sons of farmers were, because he was well-versed in agriculture "and we were feeding Europe."

Heath took a job in Winnipeg at a seed company, where he lived in a co-op house. One of his roommates was John Bowland, an animal science student and future dean of the Faculty of Agriculture and Forestry who remained a lifelong friend.

"He believed if you were a group

of people you had better negotiating power," said his son, Bob, who added that his father always supported Alberta's Co-Op grocery stores and always banked at a credit union.

Francis said that Heath was also involved in helping establish the only taxi company he ever used, the Edmonton Co-Op Taxi.

As a long-lived alumnus, Heath was an enthusiastic regular at ALES alumni events for decades. He loved attending the annual homecoming weekend and dean's breakfast, and at last year's ALES 100 centennial celebrations, he was the honoured on-stage guest who cut the cake at the opening ceremonies.

"He was always proud of the fact that he'd gone to university," said Sandra.

Heath enrolled in the Faculty of Agriculture at age 23, after a graduating from Alberta College's commercial school. His interest in the field had been piqued much earlier, however.

"He was enticed by the farm that was just outside his front door when he was growing up," said Francis, who explained that the Heaths lived on the eastern edge of the first university farm, situated at 114th Street and 84th Avenue, now the site of the Stollery Children's Hospital.

Heath's romanticized notions of being a farmer were dashed early, said Francis, when he and two partners ran an unprofitable turkey operation in Tofield, prior to his taking his job with the government.

But as a side business, he and his wife raised chinchillas in their basement and garage for about a decade. The communication skills he put to good use explaining co-ops also came into play when he convinced managers of Edmonton's brand-new Jubilee Auditorium to welcome scores of the animals into the building for Canada's first national breeders convention in 1958.

Gerald Heath died on June 2, 2016, predeceased by his wife Lorna, '49 BSc (Nursing), three months earlier. He is survived by his children Sandra, '71 BA, Jim and his wife Barb, Bob, '78 BSc, two grandchildren and twin great-grandsons. 🐾



Former Plant Science Department chair created disease-resistant alfalfa

BY HELEN METELLA

Although he didn't claim to have a green thumb, plant geneticist Peter Walton made a significant impact on how Alberta farmers can best grow and manage forages.

Walton, a former chair of the Department of Plant Science, died last March at the age of 91.

During his career at the University of Alberta, which spanned from 1969 to 1995, Walton developed disease-resistant alfalfa in what was then called the Faculty of Agriculture and Forestry.

He's remembered as a "full-on" academic by fellow plant breeder Keith Briggs, who was also appointed at the University of Alberta in 1969.

"He was personable and passionate about research and discovery in his field, and demanded high standards of performance from both his undergraduate and graduate students," said Briggs. "He was never shy to tackle the most difficult research problems."

Walton conducted genetic research that "resulted in recommendations to growers about the use of companion crops that could be used to optimize establishment of cultivated grasses, and about quackgrass control in cultivated forage land," Briggs wrote in a 2016 article documenting the faculty's strong legacy in plant genetics.

As a senior faculty member with considerable experience outside academia, his advice was often sought by the agricultural community and was very well respected, Briggs said.

Peter Dawson Walton grew up in the northern England coastal town of South Shields, yearning to be a veterinarian. But after four years in the British navy, where he was a radar specialist during the Second World War, he opted for a career he could start sooner and so studied agriculture and plant science.

His first degree, from Newcastle University, landed him a job in Sudan

with the Empire Cotton Corporation, perfecting cotton and food crops that could be mass-produced in the central rain lands.

For five years, he and his young family lived at an isolated research station about 30 kilometres from the Blue Nile River. His wife Joyce recalls the station had a handful of rough wooden houses (wired with electricity by Walton himself), and a climate that offered either 40 C heat or monsoons. Cockroaches

"were 10 a penny," and both she and Peter contracted malaria there.

"But we just felt we were helping to feed the world," she said.

Walton and his family not only learned to speak Sudanese Arabic and Swahili, but he earned his master's and PhD during the evenings.

After postings to Uganda and Nigeria, for a total of 17 years in Africa, Walton took a job teaching crop science at the University of Saskatchewan. Two years later he joined the U of A, where the Department of Plant Science was re-establishing its focus on crop variety research.

His son Mark, who was influenced by his father's fascination with science and became a surgeon, noted that Walton's zest for discovery prompted him to pursue knowledge his entire life.

"I was probably an intern or a resident already, when he took a sabbatical and went to Ottawa to learn a new technique for genetic manipulation," said Mark. "He must have been in his mid-60s then."

Walton retired at age 70, but for years afterwards drove into the country each spring "to see how the canola crops were doing that year," said Mark. He also travelled the world, indulging a passion that took root during his stint in the navy.

In addition to his wife Joyce, and his son Mark, '85 MD, he is survived by his daughter Diana Andriashek, '75 MD; and sons Godfrey, '74, BSc; and Keith, '94 MBA. ♣

THE ALUMNI CLUB

IN MEMORIAM

The Faculty of ALES notes with regret the passing of its following alumni:

HAROLD DONALD ANDERSON

'49 BSc (Ag)
of Delacour, AB, in February 2016

STEN S. BERG

'54 BSc(Ag)
of Ardrossan, AB, in November 2015

JOHN ARTHUR BROWN

'50 BSc(Ag), '52 MSc
of Okotoks, AB, in October 2015

MURIEL BROWN (MACDONALD)

'45 BSc(HEc)
of Ottawa, ON, in May 2016

GARY DOUGLAS BUCKLAND

'80 BSc(Ag), '83 MSc
of Lethbridge, AB, in December 2015

JOHN FRASER CARMICHAEL

'42 BSc (Ag)
of Abbotsford, BC, in March 2016

OREST STEVE CHARCHUN

'72 BSc (Ag)
of Derwent, AB, in January 2016

NICHOLAS ANDREW CHOMIK

'46 BSc (Ag)
of Wetaskiwin, AB, in April 2016

PETER WILLIAM DAVIDSON

'80 BSc(Ag)
of Cranbrook, BC, in October 2015

AINO EVELYN ERDMAN

'52 BSc(HEc)
of Calgary, AB, in December 2015

AUDREY EVANS (FISHER)

'45 BSc (HEc)
of Athabasca, AB, in January 2016

CATHERINE ALEXANDER FERGIE

'43 BSc(HEc)
of Spokane, WA, in July 2016

GILBERT WAYNE FRANCIS

'68 BSc (Ag)
of Saskatoon, SK, in February 2016

FRANCIS WILLIAM GARDNER

'70 BSc(Ag)
of Chain Lakes, AB, in June 2016

HARRY DAMON HANEY

'70 BSc(Ag), '74 MSc
of Calgary, AB, in December 2015

GERALD HENRY HEATH

'43 BSc(Ag)
of Edmonton, AB, in June 2016

DAVID INGLEDEW

'64 BSc(Ag)
of Leduc County, AB, in December 2015

WALLACE OAKEN KLATT

'50 BSc(Ag)
of Leduc, AB, in October 2015

DIANE ALENE LATHAM

'65 BSc (Ag)
of Wabamun, AB, in March 2016

CATHERINE MEGAN LOUGHEED

'43 BSc(HEc)
of Oliver, BC, in May 2016

MARION K. MASIH (FINN)

'46 BSc(HEc)
of Sudbury, ON, in October 2015

IRENE FLORENCE MILLER

'46 BSc(HEc)
of Elk Point, AB, in October 2015

CHERY ANNE NATTRASS

'74 BSc (HEc)
of Edmonton, AB, in December 2015

NORMAN ERIC NEAME

'53 BSc(Ag)
of Calgary, AB, in May 2016

FRANCIS JOHN ROBERT OLSON

'50 BSc (Ag)
of Drumheller, AB, in September 2015

LEONA ELIZABETH REYNOLDS

'87 BSc (HEc)
of Derwent, AB, in April 2016

JOHN STUART ROBBLEE

'45 BSc (Ag)
of Olds, AB, in December 2015

ALLAN A. SCHINDELER

'50 BSc(Ag), '52 BEd, '67 Med
of Sherwood Park, AB, in December 2015

DAVID GEORGE SCHNELL

'67 BSc(Ag)
in October 2015

DAVID STELFOX

'52 BSc(Ag), '66 MSc
in May 2016

GARY DWAYNE SMITH

'68 BSc(Ag)
of Wimborne, AB, in November 2015

DAVID ANDREW TRAUTMAN

'91 BSc(Ag)
of New Norway, AB, in December 2015

AUDREY TURTON (MCLEOD)

'43 BSc (HEc)
of Edmonton, AB, in February 2016

DOROTHY MAY WINTER

'55 BSc (Ag)
of Burnaby, BC, in January 2016

WILLIAM G. WOODRIDGE

'49 BSc (Ag)
of Coquitlam, BC, in January 2016

SAY WHAT?

ALES researchers aren't just providing solutions to global challenges. Often, they provide expert comment, helping media put emerging issues in perspective for all of us to better understand.

HEALTHY FIBRE

“Can I drink beer to get the benefits of barley beta glucan? Unfortunately, no.”

Thava Vasanthan, professor of grain science and technology, explains that he's developed a technology to separate beta glucan from barley so it can be added to food products. *Western Producer*, 5/26/16

E. COLI DANGER

“We know it is a problem...what we don't know is what it takes to kill it.”

Food microbiologist **Lynn McMullen** reveals that the long-recommended 71°C is not hot enough to kill some forms of *E. coli*, but that the optimum temperature is still a mystery. *The Western Producer*, 6/16/16

FIRE WARNING

“The Yukon has been dodging a bullet.”

Wildland fire expert **Mike Flannigan** noted that the Yukon contains three ingredients for a major forest fire—fuel, ignition and weather—and should be implementing fire-smart tactics. *CBC Radio*, 7/14/16

AGRICULTURE PAYS

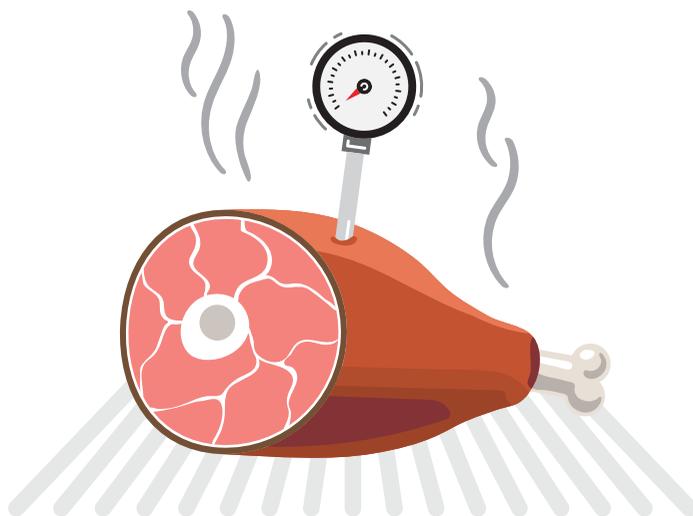
“We're edging towards \$30 billion in sales...”

Dean **Stan Blade** expresses his enthusiasm for the surge in growth of Alberta's agriculture industries in the past five years. *660News*, 3/24/16

CARBON STORAGE

“It's one of the drivers for why grazing on public lands should continue.”

Rangeland management expert **Edward Bork** explains that cattle grazing helps grasslands store lots of carbon. *Alberta Farmer Express*, 3/28/16



AFTERGRAD

Sowing seeds of connection

Reclaim Urban Farm's Ryan Mason and Cathryn Sprague were awarded the 2016 UAlberta Alumni Innovation Award.

BY RYAN MASON '15 MSc AND
CATHRYN SPRAGUE '14 MSc,
AS TOLD TO CAROLINE BARLOTT

We started a business called Reclaim Urban Farm while we were still going to the U of A, getting our masters in environmental sociology. It started as a small microgreen operation out of a basement suite, and has now grown to include 16 different outdoor plots and an indoor vertical microgreen garden.

We sell various vegetables to retailers and about 40 restaurants along with the Community Supported Agriculture box where customers pay to get a box per week. We produce about 2,500 side salads a week.

The idea for the business developed after a really inspiring talk by Dustin Bajer at the Art Gallery of Alberta. Afterwards, we discussed how it'd be great to start doing some SPIN farming in Edmonton.

SPIN stands for Small Plot Intensive, and it's basically using small pieces of land, which are in various locations and underutilized, and farming the plots intensively for our livelihood. And that conversation developed into us taking action.

Meanwhile, professors at ALES had just started up the Prairie Urban Farm, a one-acre community garden on the U of A's South Campus. So, we were able to think through some of the same issues with their support.



JOHN ULIAN

The work we've been doing was influenced by travel and the agricultural techniques we've seen in other parts of the world. We have both travelled through school programs in Cuba—including Cathryn's experience with the ALES Agro-Ecological Exchange—and noted the excellent farmer to farmer knowledge there, which is something that's very important to us now. We try to share as much as possible.

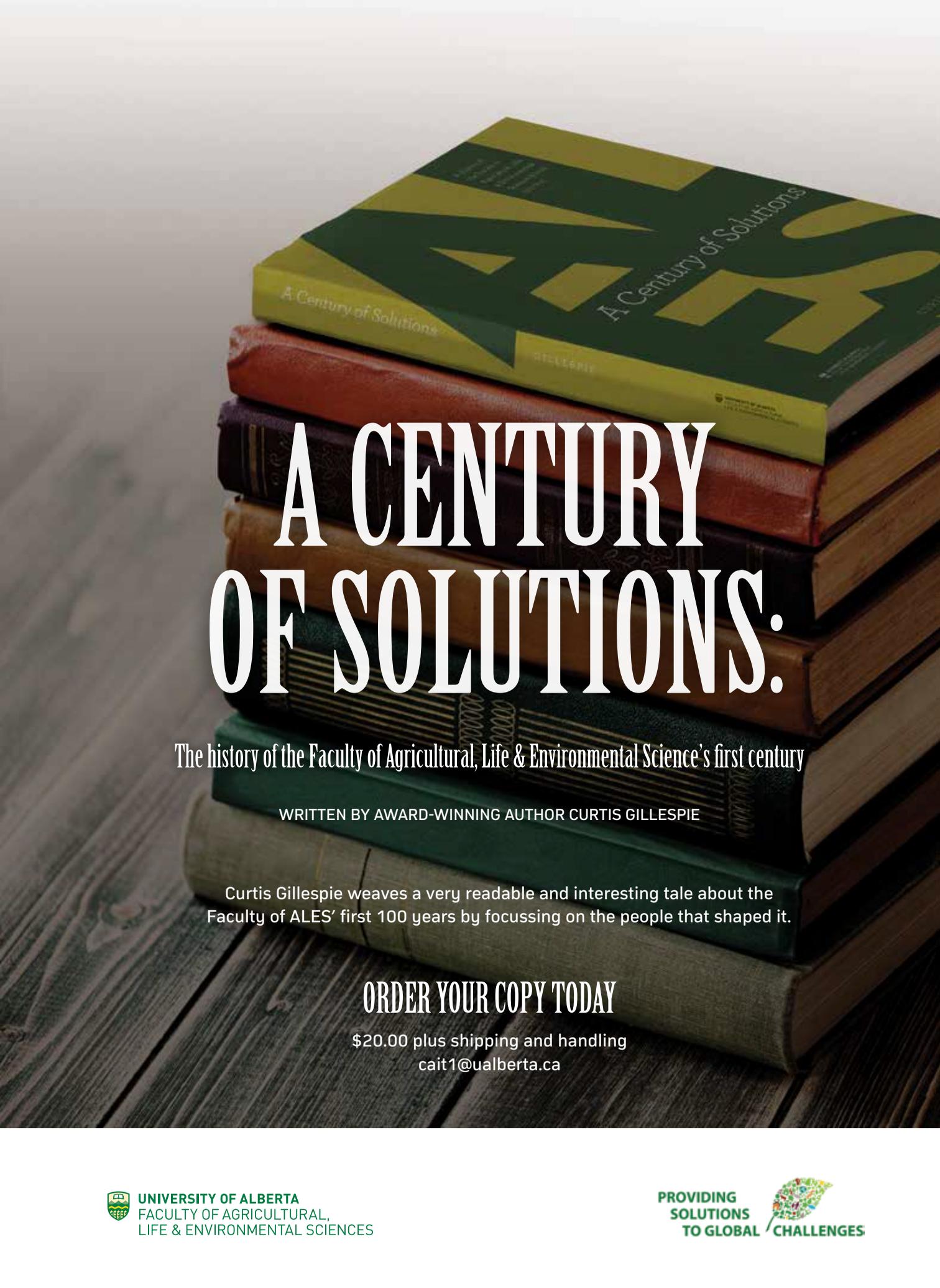
The last two winters we partnered with an environmental sociology class and an ALES Communications class; each class usually provides us with five students so we work with about 10 students per fall/winter semester. They work on various projects that use our business as a research project or case study for a class project and presentation. This year, we also participated in the ALES internship, and had one intern help during the summer, and expect to employ one or two interns each year for a few years. We also have another employee this year who just graduated from Augustana.

Our partnerships have provided a great way of connecting with the

community, too. They have allowed us to share information with people and engage them in topics of urban agriculture. It's not uncommon to have people from the neighbourhood stop by and chat with us while we're working.

One of our vacant lots is at the St. John's Institute, a University residence on Whyte Avenue, where we've seen the area transformed a little bit since starting the plot there. When we first started everyone was like, 'You've got to be careful; it's going to get vandalized with all the frat parties.' But we haven't had any problems; in fact, people from the neighbourhood will come and put stuff in our compost, and they'll call if there's something wrong.

We're excited about the growth we've had over the last four years. Our indoor microgreen garden went from two to 12 shelves and we'd like to continue expanding. We'd also like to link with people interested in farming and increase its accessibility. Ultimately, we'd like to see the model be a more city-wide initiative with other passionate people growing food in other areas. 🌱



A CENTURY OF SOLUTIONS:

The history of the Faculty of Agricultural, Life & Environmental Science's first century

WRITTEN BY AWARD-WINNING AUTHOR CURTIS GILLESPIE

Curtis Gillespie weaves a very readable and interesting tale about the Faculty of ALES' first 100 years by focussing on the people that shaped it.

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