

GREEN HOUSE

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Our expert's take on **ALBERTA'S CLIMATE PLAN**

FIVE MONTHS, 4,200 KMs

One family's cross-Canada
canoe adventure

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FOOD DESERTS

What Edmonton should do
to alleviate them

PAGE 14



GREENHOUSE

GREENHOUSE is published twice a year by the Faculty of Agricultural, Life & Environmental Sciences. It is distributed to alumni and friends of the faculty.

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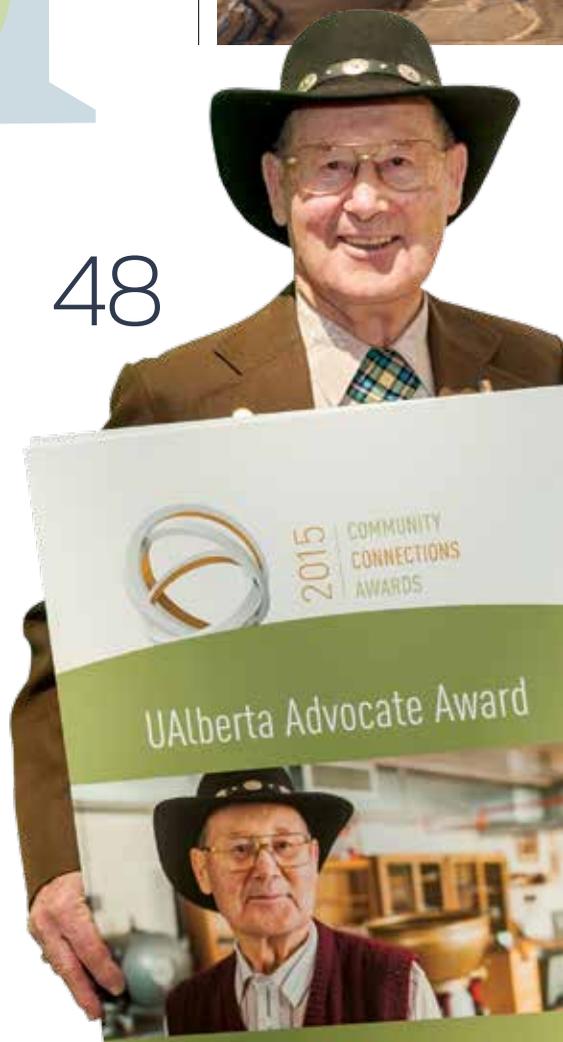
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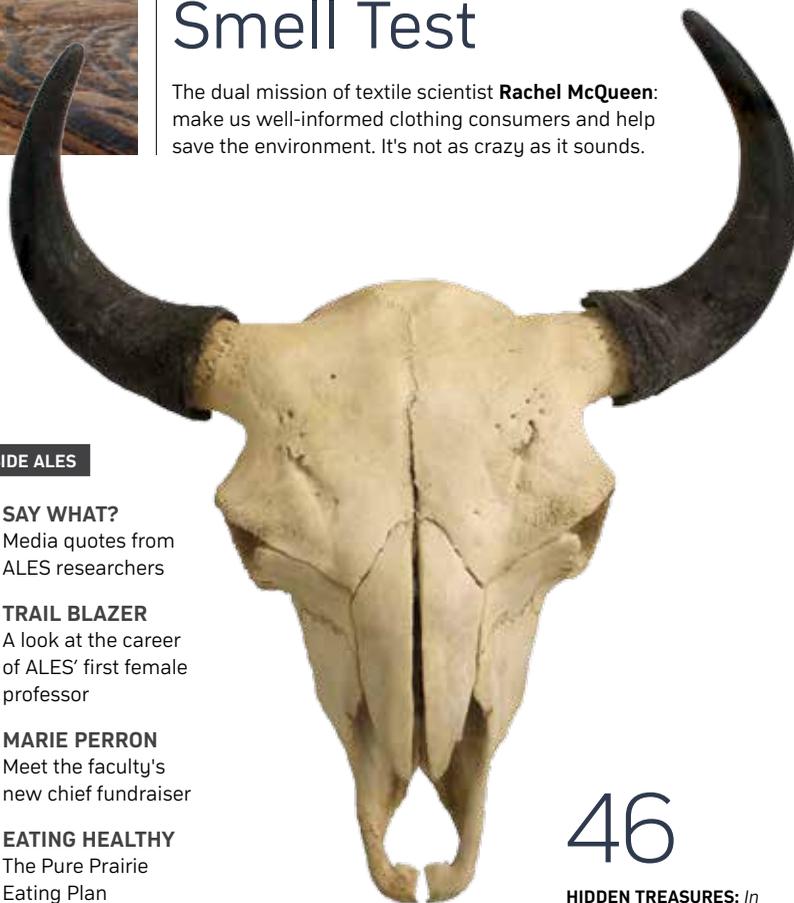


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HIDDEN TREASURES: In a nondescript classroom in the General Services Building lies this bison skull, part of two remarkable collections of wildlife and woody plants.

ALUMNI

HOW DID YOU CELEBRATE YOUR GRADUATION?

This is what it looks like when a young family arrives at its destination after a five-month, 4,200-kilometre cross-Canada canoe trip! **Benoit Gendreau-Berthiaume** '15 PhD (Forestry), his wife Magali Moffat and their five year-old son Mali, embarked on the trip that took them from Edmonton to Montreal last May after he defended his thesis. For the full story, see page 38.





FIELD DAY

Breton Plots to expand

BY MICHEL PROULX AND HELEN METELLA

Three gifts with a combined value of more than \$350,000 made to the Breton Plots last summer will strengthen the long-standing agricultural soil research station's research program and allow it to expand.

Two of the three gifts come from the children of the men who established the plots in 1929. Bill Flesher, son of Ben, the farmer who originally allowed the university to conduct research on a 20-acre parcel of his farmland, along with his wife Sylvia, sold an adjoining 60 acres at a fraction of its market value. Margaret Kemp, the daughter of soil scientist John Newton, who established the plots with his colleague E.A. Wyatt, made a significant donation to the Breton Plots Endowment Fund in

honour of her late husband Edward. It's being used to fund research projects.

Joining them were Rae and Carol Allen who have a shorter history of involvement with the Breton Plots but share an equally deep commitment to them. While they've supported the endowment fund in years past, this gift was directed to support the operations of the station, such as equipment, staffing and machinery maintenance.

"A gift like this requires a high level of trust in our operational team," noted dean Stan Blade as he announced the gifts to an audience of about 200 during the Breton Plots Field Day. His observation was not lost on the research station's long-standing manager, Dick Puurveen, who was clearly moved as he thanked the donors.

The group was then treated to tours of the plots where they were able to walk on the newly acquired land on which researchers are expected to conduct small-plot experiments. They also saw the classic rotational plots on the original site where researchers explained the development of what they characterized as the world's first elemental-based fertilizer to successfully prevent sulphur deficiency in canola, and experience low-flying drones used to film cropland and identify areas of stress.

Ongoing research at the Breton Plots have produced dramatic increases in production on low-yielding soils common on the western Canadian prairies. ♣





CATTLEMAN: Retired Senator Dan Hays gifted his herd of Hays Converters to ALES.

DEMO: Participants at the Breton Plots Field Day were treated to, among other things, tours of the classical rotational plots that were used to dramatically increase yields in Grey Luvisols.



GIFT

ALES receives gift of unique cattle herd

The Faculty of ALES' world-leading livestock genomic program received an extra boost recently when it received a generous donation.

Retired Senator Dan Hays, a U of A alumnus and rancher, will gift his herd of Hays Converters to the University of Alberta and make a major donation to maintain and care for the herd. The 100 or so breeding females and a representative herd sire group will be housed at the Roy Berg Kinsella Research Station.

"This creates an exciting opportunity to explore different applications of genomics, from management of in-breeding through genomic mate allocation, which is very important for such a small population, to prediction of feed efficiency," said Graham Plastow, the scientific director of Livestock Gentec, who added the herd will complement the existing herd of 800 beef cattle at

the research ranch.

It is quite fitting that the Hays Converters herd will be housed at the Roy Berg Kinsella Research Station. During the 1950s, Roy Berg and Harry Hays set out with a similar vision to improve beef cattle. While Berg was conducting his controversial hybrid breeding programs that resulted in a 30 to 40 per cent increase in production, former Senator Harry Hays developed his own breed.

He selected from the best available Holstein, Brown Swiss and Hereford genetics available and created Hays Converters, the first Canadian breed recognized under the Canada Livestock Pedigree Act in 1975.

The cattle are known for their fast growth, tolerance to Albertan winters, trouble-free feet, udders and calving, good milk production and fertility. 🍀

Proulx

WILDERNESS RESCUE

Grad student and post-doc rescue lost hunter in BC wilderness

Fish researchers **Tyana Rudolfsen** and **Jonathan Ruppert** weren't even supposed to be in a remote corner of southeastern B.C. last September when they stumbled on a dehydrated hunter who had been lost for more than 24 hours.

Rudolfsen, a master's student supervised by conservation ecologist Mark Poesch, had intended to switch out some equipment at a research site about three hours from Fernie, B.C., in the first few days of September. But Jonathan Ruppert, a post-doctoral fellow also working with Poesch's fisheries and aquatic conservation research team, wanted to accompany her to the site near the Alberta and Montana borders and he wasn't available until a week or so later.

That turned to be very lucky for hunter Garth McDonald. The duo found him, some 40 minutes from an unmaintained logging road and another hour from the highway, where he'd spent the night after becoming separated from his son and another hunter the morning before. When the researchers saw him, he was waving a foil emergency blanket, trying in vain to catch the attention of a search and rescue plane. His snacks and fluids were used up and he was disheveled and disoriented.

"He had an inability to walk in a straight line, he was low energy, leaning on our truck, speaking in broken sentences with long pauses," said Rudolfsen.

McDonald, who turned 67 the day

of his rescue, told them he was pre-diabetic. Ruppert gave him the one Gatorade they had in their truck and they drove him home to Fernie—only to discover an empty house: everyone was searching for him.

McDonald's encounter with Rudolfsen and Ruppert might have been the only human one likely for quite some time in the mountainous, heavily forested area that has the highest inland population of bears in North America, both black and grizzly.

"I was out at that site every couple of days between June and mid-August, and only saw two vehicles in all that time," said Rudolfsen. McDonald told the pair that bears had mauled two people in the area in the past two weeks. "It was a bad season for berries, so there have been a lot of human/bear interactions," said Ruppert.

The experience reminded the researchers why the university insists on full preparedness for its field teams. Both researchers have first aid training, and their truck was packed with equipment, from extra gasoline and tires to winches, tents and a satellite messaging service.

"We have all these safety measures, but you're fortunate if you don't have to use them," said Ruppert. "That's what was going through my mind."  Metella

HEROES: Jonathan Ruppert and Tyana Rudolfsen rescued a lost hunter when they were checking in on one of their research sites, in a remote corner of B.C.



HELEN METELLA



DIGGING IT: A record 185 people attended the Rangelands Research Institute Field Day at the Mattheis Ranch. Soil scientist Scott Chang was one of several researchers and graduate students who provided descriptions of their work on the ranch to participants.

FIELD DAY AT THE MATTHEIS RANCH

RESEARCH

ALES-FRANCE SUPERCRITICAL COLLABORATION

A renowned food engineer from ALES is leading a new partnership that teams the University of Alberta with an international network of scientists to study supercritical fluids.

Feral Temelli, who is a co-inventor of a novel drying technology for using supercritical carbon dioxide, is the team leader for a U of A team that recently signed a memorandum of understanding with Innovation Fluides Supercritiques (IFS), a non-profit organization based in France that promotes the advancement of supercritical fluid technology globally.

“The agreement gives us the opportunity to develop new collaborations and industry

connections to add value to our respective local agricultural commodities both at lab and pilot plant scale,” said Temelli.

One of the first commercial uses of supercritical fluids was the decaffeination of coffee, but now there’s an array of applications employed by many industrial sectors, including food, cosmetics, pharmaceuticals, materials, chemistry, energy and waste treatment.

In fact, said Temelli, Stéphane Sarrade, the president of IFS, is a scientist with France’s Atomic and Alternative Energy Commission who is working on the use of supercritical fluids to clean up nuclear waste, among other applications. *Metella*



DE-CAF: One of the first commercial uses of supercritical fluids was the decaffeination of coffee, but now there’s an array of applications employed by many industrial sectors, including food, cosmetics, pharmaceuticals, materials, chemistry, energy and waste treatment.



BIORESOURCES

ALES enhances its focus on bioresource research and training

John Wolodko, a senior bioresources researcher, was appointed the Alberta Innovates-Technology Futures Strategic Chair in Bio and Industrial Materials in ALES. He started Oct. 15, 2015. In this new position, he will assist in creating stronger links between ALES' researchers and Alberta Innovates-Technology Futures.

ALES researchers have already expanded the understanding of the science behind bio-based products

and are engaging in applied research to create new technologies and solutions.

Wolodko's appointment creates immense potential for more graduate training and research focused on an emerging area of demand from industry: bio-based goods made from materials using agriculture and forest products, said Ruurd Zijlstra, chair of the Department of Agricultural, Food and Nutritional Science. *Metella*

BIO-GUY: Senior bioresources researcher John Wolodko was recently hired to increase the faculty's capacity in this emerging field.

FARM TOUR

REES students informed by local producers

A group of Resource Economics and Environmental Sociology students learned first-hand how local producers are integrating the latest technologies into their farming practices to feed a growing world population.

A group of 20 students toured farms in Kingman, Alberta, about an hour outside of Edmonton, and were given a demonstration of an unmanned aerial vehicle (UAV) intended for agricultural uses, developed by Camrose-based company Prairie Sky. The UAV can generate a map of growth patterns on the land, targeting fertilizer to low growth areas, and reducing spray overlap by five to 10 per cent.

Tour organizer **Will Pattison** '70 MSc (Ag) has been farming in the area since the early 1970s. He noted that "farming has changed more in the last 25 years than in any other period."

He cited precision farming, variable rate technology and advanced software as three major developments.

"As an international student from China ... interaction with farmers definitely deepens my understanding of different types of farming and agricultural activities here in the province. It also informs me of how my ongoing research project can be related and be further applied to agriculture in the future" said REES MSc student Haoluan Wang. *Metella*

FIELD TRIP: MSc student Anita Laryea was one of 20 REES students who visited farms near Kingman to talk with producers.





GRAD STUDENT EXPERIENCE

Book demystifies obligatory graduate oral exams process

ALES wetland ecologist **Lee Foote** has graduated his fair share of masters and doctoral students over the years, and sat on many graduate student committees so when one of his better graduate students almost failed her candidacy exam, he was perplexed.

"What is wrong with this picture?" he wondered.



He went online and visited libraries and to his surprise, didn't find much to help graduate students prepare for their required oral exams. He then talked

to graduate students.

"The aura that came about is (that oral exams are) a rite of passage, there's a cloak of secrecy, and they don't tell you the stuff deliberately," he said.

To demystify the process and help students prepare, Foote added the

information he had gathered from his chats with those graduate students to the notes he had accumulated after 10 years of teaching a graduate organization class. The result?

Oral Exams: preparing for and passing candidacy, qualifying and graduate defenses, a book that provides graduate students with solid advice on everything related to oral exams from managing supervisory committees to overcoming nervousness, exam-day preparations, how to handle yourself and "manage" the exam, and even visualization exercises.

"The most important thing students will get out of the book is an understanding of the exams," said Foote.

And the student who triggered it all? She recovered from the near-miss, earned her PhD and published four papers. She now works as a successful ecological analyst. *▀ Proulx*

ASTECH AWARDS

SOILS AND POLYOLS PROJECTS WIN TOP ALBERTA SCIENCE HONOURS

ALES researchers won Alberta's highest science and technology honours, the ASTech Awards, for two of the faculty's most prominent projects featuring green benefits.

The Breton Plots management team, under the direction of **Miles Dyck**, a soil scientist in the Department of Renewable Resources, won the Innovation in Agricultural Science Award for its research on both grey soils and climate change mitigation.

Meanwhile, the Lipid Chemistry Group, led by **Jonathan Curtis**, took the Outstanding Achievement in Applied Technology and Innovation Award for its development of bio-based chemicals. These vegetable-oil based polyols are being used as the building blocks for a range of plastics and synthetic materials, including greener polyurethanes used for paints and varnishes, and for insulating foam. *▀ Metella*



GRADUATE STUDENT EXPERIENCE

ALES student named Rhodes Scholar

BY MICHEL PROULX AND GEOFF MCMASTER

Carley-Jane Stanton, a fourth-year ALES student majoring in agricultural and resource economics, is one of three U of A students to receive a Rhodes Scholarship, widely considered the most prestigious scholarship in the world.

It is the first time three University of Alberta students have received Rhodes Scholarships in the same year.

Along with Arts student Billy-Ray Belcourt and medical student Zia Saleh, Stanton and eight other students from across Canada will pursue post-graduate studies at the University of Oxford next September.

Stanton started in linguistics at the U of A and took an elective in ALES' Department of Resource Economics and Environmental Sociology entitled "The Plate, the Planet and Society" about food systems and food economics.

Having experienced food insecurity as a teenager living on her own, the issues discussed in the course resonated with her so much, she changed her program.

She completed a placement with Sustainable Food Edmonton and then one of her instructors, Brent Swallow, asked her to serve as a research assistant on the food-security-related project ALES conducted in India. She worked closely with social policy expert Rhonda Breitkreuz from the

Department of Human Ecology on the project, an experience she called "transformative."

"Ever since then it's been a snowballing effect."

She's since taken up leadership roles at the South West Edmonton Market and the Edmonton Food Council, and is the founder of the Alder Food Security Society.

Her plan for Oxford is to complete a master of philosophy in economic and social history—a slight departure from her current research, she admits, but training she hopes one day to apply to problems of food security here at home.

"What I want to do is become a little more literate in dealing with qualitative data, narratives and lived experience, and incorporating that into economic analysis," she explained. "So far, I've been working a lot with qualitative data. Lived experience can be very rich knowledge, and doesn't necessarily play out in the economic models I've been learning."

The three Rhodes Scholarships in a single year is a first for the U of A, which sent two students to Oxford in 1977 and 1994. When Stanton, Belcourt and Saleh begin their studies abroad in the fall, they will bring the university's total number of Rhodes Scholars to 71, dating back to 1913. ♣





EXPERIENTIAL LEARNING

Project Serve reinforces sustainability lessons outside the classroom

Enthusiastic ALES students diverted hundreds of useable items from the landfill, tidied yards, prepared gardens and donated many other hours of elbow-grease to Project Serve last September.

ALES' Project Serve is a community service-learning initiative that offers students the opportunity to volunteer for half a day with local organizations that focus on issues relevant to their studies.

Rashell Bolduc, one of 95 students who participated this year, helped clean up around a heritage house at a farm site of the Whitemud Equine Learning Centre Association. The non-profit organization, which provides city-dwellers easy access to horses for mental health and physical therapy, urban youth self-esteem and general learning about horse farms, wants to use the building as an office.

"We took some of the stress off and that allows them to focus on the more important things, like the horses," said Bolduc, a first-year Environmental and Conservation Sciences student. "This experience has built my belief in volunteer work."

There is statistical research showing that students engaged in community service-learning experiences tend to achieve better academically, said

Katherine Zwicker, ALES' student engagement coordinator.

This year, the event's fourth iteration, students were deployed to eight organizations, including Edmonton's Food Bank, the Edmonton Organic Growers Guild, Edmonton Reuse Centre, Green and Gold Garden, Prairie Urban Farm, Whitemud Equine Learning Centre Association, Wildlife Rehabilitation Society of Edmonton and YESS: Youth Empowerment & Support Services.

Some of the opportunities included having students harvest food for a canning workshop and build a herb spiral garden and trellis at the Prairie Urban Farm. At the Reuse Centre, they painstakingly separated typical donations — boxes filled pell-mell with half-used crayons, popsicle sticks, small plastic toys, etc.

"We get 20 tonnes of donations every month and volunteers sort 80 per cent of it," said Sarah Snider, the centre's volunteer coordinator. "We really could not function without volunteers."

Reuse challenges people's behaviour when discarding stuff, she said, adding that seeing what comes in and how it can be repurposed, as the ALES students did, is far more effective. ■ Metella

STUDENT AWARDS

NUTRITION GRAD STUDENTS SCORE PRESTIGIOUS NATIONAL SCHOLARSHIPS

Underscoring the significance of their abilities and research questions, three ALES nutrition graduate students received highly prestigious Government of Canada scholarships.

Two are Vanier Canada Graduate Scholarships, won by PhD students **Leticia Pereira** and **Maira Quintanilha**. The third, for master's student **Laura Adam**, is the Frederick Banting and Charles Best Canada Graduate Scholarship-Master's.

Each of their projects is aimed at understanding and promoting health in pregnancy, with a focus on healthy nutrition.

The Vanier Canada Graduate Scholarship is one of the most prestigious scholarships for doctoral candidates in Canada. Valued at \$50,000 per year for three years, it considers three equally weighted criteria: academic excellence, research potential and leadership.

The Frederick Banting and Charles Best Canada Graduate Scholarship-Master's is equally prestigious, providing \$17,500 in funding to a master's student for one year. ■

Metella



FOOD FIX

Community gardens and farmers markets providing limited fix for food deserts

Edmonton should be more supportive of farmers' markets in the suburban areas with poor supermarket access and also make it easier to access vacant land for community gardens across the city.

That's one of several recommendations made by Department of Resource Economics and Environmental Sociology masters student **Haoluan Wang** and his supervisors **Feng Qiu** and **Brent Swallow** after they conducted a study examining the city's food deserts.

They found, surprisingly, that people in several lower-income mid-city neighbourhoods had better

access to food than residents in some higher-income suburban neighbourhoods.

Wang wanted to know if the farmers' markets and community gardens in the mid-city neighbourhoods had something to do with it.

He couldn't make a conclusive statement about the effect of the city's 17 farmers' markets but when the city's 61 registered community gardens were factored into the analysis, something notable happened.

"Those four food deserts (in the mid-city) disappear to some extent," he said. *Metella*



BETTER SEX

Fair division of chores leads to better sex life

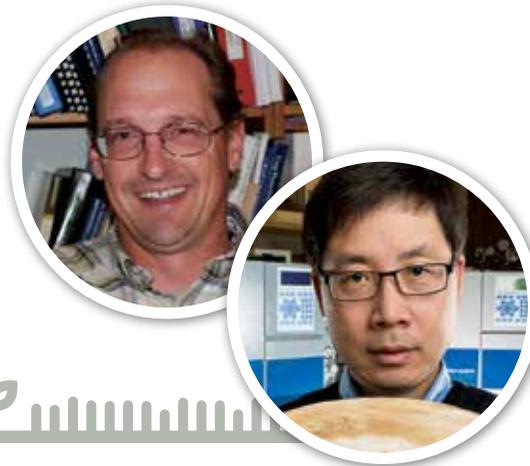
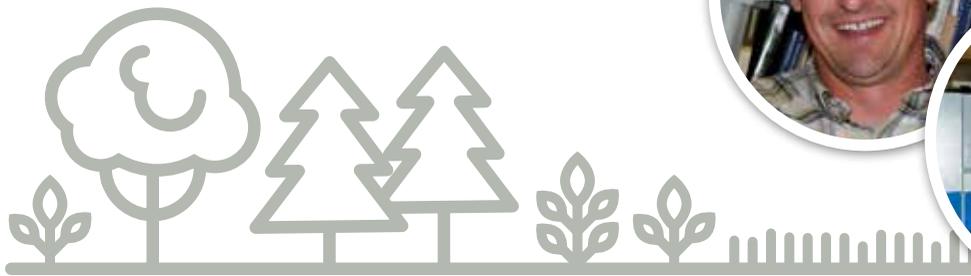
Looking for more and better sex? If you're a man, you might consider doing the dishes once in a while.

A new ALES study revealed that couples enjoyed more frequent and satisfying sex for both partners when men made a fair contribution to housework. The new study contradicts a widely reported 2012 US study that stated that when men perform what is regarded traditionally as female housework, things like doing the dishes, cooking and laundry, the couple had less sex.

Matt Johnson, a family ecology professor in the Department of Human Ecology poured over data from a five-year study of 1,338 German couples to come to that conclusion.

"Rather than avoiding chores in the hopes of having more sex, as prior research would imply, men are likely to experience more frequent and satisfying passion for both partners between the sheets when they simply do their fair share," he said. *Proulx*

CARBON STORAGE



Trees and grassland in agricultural landscapes help boost soil carbon storage

Alberta soils could store significantly more carbon if trees are integrated into cropland areas, new ALES research reveals.

ALES soil scientist **Scott Chang** and **Edward Bork**, a rangeland ecologist, looked at the influence of shelterbelts, hedgerows and silvopastures to evaluate the role of trees and different land uses

across the agricultural landscape in mitigating climate change, and to see which system is more conducive to carbon storage.

They found that soils under trees stored 36 per cent more carbon.

During the study, which took place on plots in south-central Alberta over four years, the benefits of trees remained dependent on the

adjacent land use.

"Trees had the greatest benefit in raising soil carbon levels in agroforestry systems where they were combined with neighbouring annual cropland subject to cultivation, while perennial grassland maintained soil carbon levels similar to that of the natural forest," Bork said. *Metella*



HEALTH

Pregnant Alberta women not getting enough omega-3 fatty acids

An overwhelming number of pregnant and lactating women in Alberta are not meeting the recommended intake of specific omega-3 fatty acids vital to their babies' development and to their own health, according to new ALES research.

In a study of 600 pregnant women in Edmonton and Calgary, only 27 per cent were meeting the recommended minimum of 200 mg of DHA (docosahexaenoic acid) per day.

DHA is the major omega-3 fatty acid required during pregnancy for fetal and placental development,

and is critical for infant brain development and other growth in every cell of the body.

"DHA is also important to a mother's health," said nutrition researcher Catherine Field of the Department of Agricultural, Food and Nutritional Science. "Low levels in the body have been associated with depression."

The recommended intake of DHA during pregnancy could be met by consuming one to two portions of fish per week or taking supplements. *Metella*

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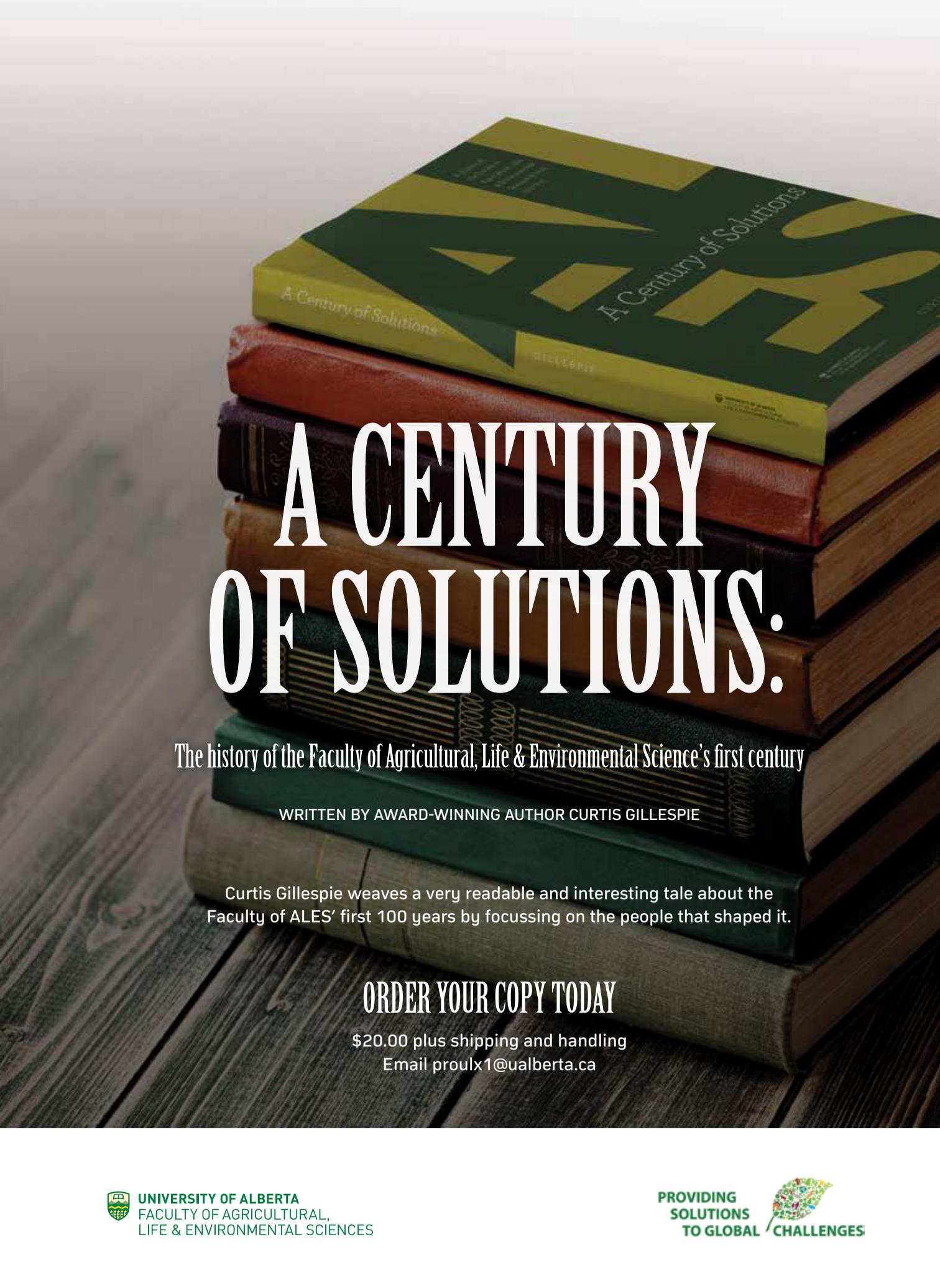
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FERTILE

ALES' PIONEERING JOURNEY ALONGSIDE PLANT GENETICS

GROUND

BY HELEN METELLA AND KEITH BRIGGS



A

Most every edible plant that the modern world calls food is a result of plant breeding, says

Keith Briggs, a professor emeritus in plant breeding and crop science, and founding chair of the Department of Agricultural, Food and Nutritional Science.

“Plant breeding is very applied and links into the second biggest industry in Alberta — agriculture,” he says.

Plus, he adds, there would be no animal industry without plants and forage.

“And the U of A was in it from day one,” says Briggs, which begs the question: how closely related is the study of plant genetics to the Faculty of ALES?

WHICH CAME FIRST, ALES OR PLANT GENETICS?

The field of genetics is just barely older than what is now the Faculty of ALES. Gregor Mendel’s famous laws of inheritance, deduced by studying peas, and his terms, “recessive and dominant traits,” were published in 1865. But Mendel’s studies were not recognized until 1900, when the new science was dubbed “genetics.” Fifteen years later, the Department of Field Husbandry was established at the University of Alberta.

Very quickly, genetic research and plant-breeding experiments became a high priority with the department because agricultural settlers to Alberta needed to know which plants they’d brought with them would thrive here. New varieties were also bred that could be specially adapted to local growing conditions, including diverse soil types, short and cool growing seasons, long days, unpredictable drought and high risk of frost, as well as specific insect and disease threats.

NAMING NAMES

Before the current era, in which seed companies have a say in naming new plant varieties, the breeders named them. Many varieties developed in ALES over the years were named by its researchers. Altex and Andor canola, for instance, were named by **Zenon Kondra** after his sons Alex and Andrew. In 1990, Briggs named AliKat wheat, the first wheat in Canada bred with specific tolerance to acidic soils, after aluminum (of which acidic soil has a lot) and the wheat variety Katepwa, on which his acid-soil-tolerant germplasm was based.

Less known is the naming legacy of **Robert Newton** — the faculty’s dean from 1940 to 1942 and then the university’s president. Throughout the 1930s, he excelled in research about crop production, frost and drought resistance, and the bread-making quality of wheat.

He coined the term “pesticide.” It’s a blend of “pestis,” the Latin word for plague and “biocide,” a chemical substance or micro-organism that destroys or deters harmful organisms.

OTHER FIRSTS

During the 1950s, ALES was a hotbed of high achievers in plant genetics. Researchers here became the discipline’s foremost university group in the world with their groundbreaking studies. Among them:

Clayton Person increased the understanding of how the genetic structure of a parasitic population (e.g. a disease) interacts with that of its host population (e.g. plants).

John Kuspira developed unique ways to manipulate the chromosomes of wheat, which led to an understanding of which individual grass species were the ancestors of modern wheat species. That was important knowledge for wheat breeders, because when there’s a

problem with a species, plant breeders go looking for a genetic explanation. If they can’t find the gene in the species they’re working with, they go looking for relatives.

Karlis Lesins developed the first self-pollinated alfalfa germplasm and also became a renowned Medicago taxonomist (Medicago is the genus of flowering plants of which alfalfa is the best example.) His collection of more than 3,000 alfalfa and Medicago samples was donated to the USDA’s Medicago collection upon his retirement.

Rustem Aksel produced much of the foundational research methodology for the genetic study of quantitative traits in plants (those that are controlled by multiple genes), and for the quantification of maternal inheritance in plants. “If you are taking quantitative genetics (courses) today, the theories he developed are probably part of the curriculum,” says Briggs.

Seed royalties: In the 1990s, Briggs developed a first-in-western Canada policy allowing the U of A to collect royalties on seed sales of faculty-released varieties. As a result, in canola alone, seed royalty income has already returned many millions of dollars.

A CHAMPIONS OF CEREALS

When the faculty re-established a research focus on cereals in 1969, Briggs arrived to work on barley and wheat.

In wheat breeding, he emphasized selection methods and the genetics of grain quality, early maturity, straw strength, stripe rust resistance, stress tolerances, toxicities in soil and sensitivity to copper deficiency.

After studying acidic soils during a stint in Africa, Briggs developed AliKat wheat, bred with specific tolerance to acidic soils by altering a single gene in the wheat variety Katepwa. That led to joint studies with other research groups

in the science faculty on gene isolation and DNA characterization of the single gene. By discovering how the single gene worked, they could apply it to many other species.

In barley, Briggs also developed methods to select for straw strength and for resistance to a common disease known as leaf scald.

After Briggs retired in 1999, wheat-breeding breakthroughs in the faculty continued, with resistances for yellow rust and Fusarium, both of which can be devastating to crops.

“Yellow rust is a threat to grain productivity and farmers’ income,” said Briggs. “Fusarium is a threat to the food and feed industry because infected grain is poisonous.”

Since 2012, ALES wheat breeder **Dean Spaner** has registered four new varieties of wheat. All improved on a wheat that’s already esteemed internationally due to its high protein content and excellent bread-making qualities. His Thorsby and Coleman varieties of Canada Western Hard Red Spring Wheat both have good resistance to leaf and stripe rust, while the latter has better resistance to Fusarium head blight. The Go Early variety has very good resistance to lodging and bunt, and very good protein quality. The Parata variety also has good lodging resistance, plus good flour yield and good stem and yellow rust resistance.

TAKING THE LEAD ON CANOLA

Oilseeds researcher Zenon Kondra came to the U of A in 1969, having already helped develop two new “double-zero” rapeseed varieties that formed the basis of a new specialist rapeseed crop called canola.

But when both varieties proved to mature too late for Alberta’s Parkland region, he bred for early maturity and high yield, to produce Altex and Andor canola.

A few years later, Briggs, by now the plant science department chair, negotiated the merger of the Alberta Wheat Pool canola breeding program with that of the U of A, and formed a tripartite breeding program funded by Agriculture Canada, Alberta Agriculture and the Canola Council of Canada.

“If we hadn’t succeeded (in that) we probably would have folded the canola program because we didn’t have enough funds to do it,” says Briggs.

In the 1980s, a disease called blackleg threatened to destroy the canola industry. **Gary Stringam** successfully bred a line of blackleg-resistant canola called Quantum canola. The resistance gene he discovered is now found in most varieties of canola.

Since diseases adapt and re-emerge, canola breeder **Habibur Rahman** and plant pathologist **Stephen Strelkov** created canola varieties that are resistant to the clubroot pathogen.

Rahman also introduced genes from cabbage and cauliflower species into canola to produce early flowering canola, and recently developed the first line of canola hybrid that offers double-resistance to clubroot, the crop’s most significant disease threat.



FOOLING THE ENEMIES OF FORAGE

Disease-resistant alfalfa was developed at ALES by **Peter Walton** in the 1970s. His followup research showed growers that companion crops could optimize the establishment of cultivated grasses, that quackgrass could be controlled in cultivated land using new herbicides and tillage, and that variety research could assist “alfalfa sick” soils.

Walton’s genome- and chromosome-level research into understanding the evolutionary origins of the Triticea grass family showed that useful traits in wild species, including cold, drought and salinity tolerance, could be transferred into adapted or newly created species.

ALES’ COMMERCIAL IMPACT

ALES has bred numerous commercially successful plant varieties. Some with the greatest commercial impact include Banff Kentucky bluegrass, a major continuing component of lawn and turfgrass mixes that’s still earning royalties that support a student scholarship in ALES (developed in 1960); AliKat, the first wheat in Canada bred with specific tolerance to acidic soils (1990); and Quantum, the first blackleg-resistant canola variety in Canada (1995). ▀

Research for this piece is from 100 Years of Plant Genetics and Plant Breeding in the Faculty of ALES, a 2014 article by Keith Briggs, professor emeritus in plant breeding and crop science, former chair of the Department of Plant Science and first chair of the Department of Agricultural, Food and Nutritional Science.

GENETICS BY THE NUMBERS

HOW MANY COMMERCIALY SUCCESSFUL VARIETIES HAVE BEEN CREATED BY ALES PLANT BREEDERS?



UNPACKING the CLIMATE CH

Is the Alberta Climate Leadership Plan feasible? How will its five key promises affect urban and rural Albertans? Helen Metella interviews **Debra Davidson**, an expert on climate change, who helps us understand what it all means.

ANGE PLAN



In November 2015, the Alberta government announced a decisive climate change strategy that Premier Rachel Notley characterized as “turning the page on the mistaken policies of the past.” The goal of the Alberta Climate Leadership Plan is to make Alberta one of the world’s most progressive energy producers, by reducing the province’s greenhouse gas emissions.

The plan is also intended to help Canada fulfil the pledge that it, and the rest of the world, made at December’s United Nations Climate Change Conference in Paris: limit the world’s temperatures to no more than 2 degrees Celsius above pre-industrial times.

But is Alberta’s plan doable?

Debra Davidson is an environmental sociology researcher in the faculty’s Department of Resource Economics & Environmental Sociology. A former member of the Intergovernmental Panel on Climate Change, she was a contributing author to the Fifth Assessment Report, released in 2014. She attended the Paris climate conference last December where she was heartened to witness international co-operation.

Here’s how Davidson sees the key promises in the Alberta plan playing out:



TREVOR CHOW-FRASER



A tax on carbon — \$20 per tonne in 2017 and \$30 per tonne in 2018, rising at inflation plus 2 per cent, every year after that.

What does that mean?

According to government figures, this means Albertans will pay an average of 4.7 cents more per litre of gas in 2017, and 6.7 cents in 2018. To produce the electricity that heats some of our homes, on average we’ll pay an extra \$320 in 2017, rising to \$470 by 2018. (Coal-fired generating units produce 55 per cent of Alberta’s electricity, with the rest supplied by natural gas.) However, these figures apply only if there are no conservation efforts or changes in behavior in households, and will

vary substantially by home size and lifestyle.

The estimated \$3 billion raised annually by this tax will go into building green infrastructure and public transit. A program to provide rebates from this tax for low-income Albertans is being developed.

Is it feasible?

“People are going to be irate and then we’ll get over it as we all realize it isn’t that big a deal,” says Davidson. “We have the lowest taxes in the country. And we tend to forget that the revenue that’s collected will be invested in things that are positive for Alberta. The impact on household pocketbooks is sufficiently small that it will lose our attention fast. For households for which it represents a bigger dent in pocketbooks, they have the option to change their emissions (by taking measures to reduce the house’s carbon footprint like insulating and sealing the home, using more energy efficient appliances and lightbulbs, for example). That’s the incentive for

a change in behaviour.

As for industrial users, Davidson says: “Large emitters have already been paying a ‘tax’ for years, through the existing carbon trading system (CCEMC), so the new rules will not likely affect them much. Businesses that are associated with high electricity usage will be affected, but the whole idea of a carbon tax is to incentivize conservation and innovation.”

How will it affect rural and urban Albertans?

“Probably the biggest difference between rural and urban populations will be in the amount of automobile and truck use,” says Davidson. “Relatively speaking, people in rural communities put more miles on their vehicles, so they’re going to feel it more at the pumps. But this is going to be a drop in the bucket compared to all the other factors in the economy ... even at \$30 a tonne, that represents a few cents (per litre of gas).”



A cap on oilsands emissions of 100 megatonnes annually.

What does that mean?

Alberta's oilsands operations currently emit approximately 70 megatonnes annually and will never exceed 100. In 2013, Canada's total GHG emissions were 726 megatonnes. Alberta's total was 267.2 megatonnes.

Is it feasible?

This is the most symbolic and least ambitious part of Alberta's policy, says Davidson. "It's a big move to put a limit on carbon emissions, but the limit is so high that it's not compatible with our national climate-change reduction goals.

"Canada has set a goal of reducing emissions to 60 to 70 per cent below 2006 levels by 2050. So, meeting Canada's mitigation goals will require that total emissions for the entire country in 2050 do not exceed 220

to 250 or so megatonnes. If the oilsands alone takes 100 of these, that leaves only 120 to 150 for the rest of the entire national economy — not exactly our fair share is it?"

What's the real question Albertans need to face?

"The scientific reality is, if we're going to be carbon neutral by the end of the century (as the Paris Agreement promises) then the vast majority of carbon deposits have to stay in the ground," says Davidson.

"This sentiment is widely held in the scientific community. A paper published in *Nature* in January 2015 (McGlade and Eakins, Vol 517) assessed the amount of carbon that is still locked up in fossil fuel reserves and the amount we can reasonably still burn in the coming years while staying within our 2C target. The yet-unburned carbon sitting in reserves is three times the amount that can be safely burned. And Alberta's oilsands reserve alone represents a rather huge proportion of that unburned carbon. The authors conclude that 'any increase in unconventional oil production is incompatible with 2 C.' "



Phase out coal-fired electricity by 2030.

What does that mean?

Alberta has 18 coal-fired generating units at six electricity plants. They create 55 per cent of the province's electricity, making Alberta the largest coal user in Canada. Under the federal/provincial Emissions Performance Standard Framework of July 2015, Alberta was already committed to retiring those units. However, the majority could have continued until they were 50 years old. So six could have operated to between 2036 and 2061. Now they won't.

The Coal Association of Canada says approximately 3,000 Alberta miners will be affected by closing the plants, and the provincial government says another 1,500 plant workers will be affected. However, the province expects to see billions of dollars in new renewable energy investment in Alberta.

Is it feasible?

Yes, absolutely, says Davidson. "We have lots of other options available to us here. Alberta has some of the best solar resources in the world and we're not capitalizing on them. If we were to substantially invest in them and combine that with downsizing coal, we'd probably come up with a net gain in terms of jobs."

How will it affect rural and urban Albertans?

"We do have some communities where coal is the main employer in town and without question there needs to be sensitivity to that with resources invested in retraining those individuals and support for economic



development in renewable resources,” says Davidson.

“But in the province as a whole there aren’t a lot of coal mining jobs out there, and frankly, renewable energy is more labour intensive. It generates more jobs per kilowatt hour of energy. And it will be more beneficial to those communities too, because coal mining is not a healthy life.”

How will it affect rural and urban Albertans?

A different potential windfall, says Davidson: “I’m hopeful that the government will pay attention to the opportunity to promote ‘micro-solar,’ which means you and I putting solar panels on our roofs and selling the excess energy to the grid ... it could become very lucrative for those in a position to invest in solar.”



Put more emphasis on wind power.

What does that mean?

The Alberta Climate Leadership Plan promises that renewable energy will power up to 30 per cent of Alberta’s electricity grid by 2030. The government will appoint an independent facilitator and negotiator to help Alberta make the transition, and offer financial support to retrain coal sector workers for new jobs. Additionally, the government has promised “market mechanisms such as auctioning” to keep the cost of renewable energy low. Currently, Alberta generates about nine per cent of its electricity from renewable energy sources.

Is it feasible?

Yes, says Davidson, now that the costs of wind power are coming down. “The other thing to note is one of the biggest barriers to renewable energy is that it’s intermittent – you can’t simply expand production when it is needed. But wind and solar are compatible. Solar is more active in the day and wind is more active at night, so it can reduce this intermittency problem.”

How might it affect rural and urban Albertans differently?

“Technologically, wind power can only be developed at a large scale,” said Davidson. “In Europe, wind power development has been happening as community-owned operations, with small rural communities that develop wind power cooperatively. For wind generation to become a really big feature in the cities, we’re going to be waiting for further technological developments that would allow wind power on a smaller scale.”



Energy companies must reduce methane emissions by 45 per cent of 2014 levels by 2025.

What does that mean?

Methane is 30 times more intense as a greenhouse gas than carbon dioxide. It is emitted during the production and transport of coal, oil and natural gas.

The oil and gas industry produced 30.4 megatonnes of methane emissions in 2013, representing 70 per cent of the provincial methane emissions.

Is it feasible?

Several months before Alberta’s plan was announced, the clean technology sector noticed a surge in interest from oil companies seeking assistance in reducing emissions from tailings ponds, the *National Post* reported in January 2016. The paper said the sector “is poised to be one of the few growth businesses in Alberta in 2016.”

What's the bottom line? The major oil producers who backed the climate plan consider it a win for both the environment and the economy. Shell Canada president Lorraine Mitchelmore said it gives Canadian oil companies an incentive to become the world’s most progressive energy producers. Natural gas producers such as Andy Mah of Advantage Oil and Gas Ltd., hope it will help them develop natural gas without as much opposition.

Environmentalists believe it will substantially cut Canada’s carbon emissions and diversify our economy.

Critics, including the Wildrose Party, believe it will cause drilling activity to further collapse, with more oilsands job losses and the devastation of coal-producing communities. ♣

THE PARIS AGREEMENT

A Climate Change Primer

On December 12, 2015, 195 countries signed the Paris Agreement, the first-ever universal, legally binding climate deal. It will come into force in 2020, if 55 countries that account for at least 55 per cent of global emissions, ratify the agreement.



HIGHLIGHTS:



Limit the rise in global temperatures to well below 2C compared to pre-industrial times, while striving to limit them to 1.5 C.



Revise and publish national greenhouse gas reduction targets before 2020 and then every five years.



Contribute at least \$100 billion annually to developing countries to help them reduce emissions and minimize the economic impact.



Achieve a carbon neutral world between 2050 and 2100.

The notion of how much we can safely emit is premised on the notion that 2 C is a safe limit. “That is hugely questionable,” says climate change expert Debra Davidson. “We are already experiencing significant negative impacts at 1 C of warming.”



WHY 2 C?

Scientists have long agreed that a 2 C increase in global average temperature from pre-industrial times will bring about irreversible catastrophic climate change. What we have already been experiencing — increased drought conditions, more intense hurricanes and tropical storms, and drier forests more vulnerable to pests and wildfires — will only intensify.



GLOBAL TEMPERATURE CHANGE

The difference in global temperature between the end of the last ice age 11,700 years ago and now is 5 C. The difference since the start of the industrial revolution and now is almost 1 C, with the majority of that difference occurring since 1975.



EMISSIONS LIMIT

In its most recent report, the Intergovernmental Panel on Climate Change introduced the notion of a ‘Carbon Budget.’ To stay within the goal of limiting the rise in global temperatures to 2 C, there is a finite amount of carbon emissions we can produce: one trillion tons. According to the IPCC, by 2011, 515 billion tons have already been emitted.



THE ODDS OF SUCCESS

The Intergovernmental Panel on Climate Change suggested that the world has a 66 per cent chance of limiting the rise in global temperatures to 2 C if it limits its carbon emissions to one trillion tons.

PASSING THE SMELL TEST

TEXTILE SCIENTIST
RACHEL McDUFFEN
IS ON A MISSION
TO GET US TO
WEAR SUSTAINABLE
FABRICS AND SAVE
THE ENVIRONMENT.

ELIZABETH WITHEY EXPLAINS.



Rachel McQueen isn't easily hoodwinked by huge clothing sales, or trendy brands, or the perfect fit. She shops, and she's

stylish, but what usually snags McQueen's attention is the tiny print tags saying what the fabric is made from. Polyester. Silk. Acrylic. Nylon. Wool. Viscose. Cotton. Ever the textile scientist, even when browsing the racks, McQueen is doing research.

"I'm always looking at the labels," she says. "My husband gets sick of it. 'Come on, Rachel, it looks good!'"

But McQueen doesn't get sick of it. And it's that passion that drives her research into why fabrics behave the way they do in relation to our bodies and behaviours. From a modest laboratory in the antiseptic basement of the Department of Human Ecology, the vivacious New Zealander and her assistants are tirelessly working to better understand the complex relationship between fabrics, odour and laundering through sensory studies and, thanks to a close collaboration with U of A chemist James Harynuk, chemical analysis.

And McQueen's findings are attracting international attention, too. Cotton Incorporated, a North Carolina-based non-profit that provides information to U.S. cotton growers and U.S. brands and retailers, calls McQueen's research "ground-breaking" for the textile industry.

"Her lab could do the wear trials and the odour evaluation, as well as the chemical analysis," says Mary Ankeny, Cotton Inc.'s senior director of textile chemistry research, with regard to odour research they contracted McQueen to do on cotton versus other fibres. "She really was able to look at the whole picture and provide the textile industry with some valuable information on how cotton is able to release odour as compared to synthetic fibres."

Response to a Cotton Inc. webinar featuring McQueen and her research findings was "tremendous," Ankeny

recalls. "We had over 200 attendees. This is information that people really need. It was one of our most highly attended webinars."

MOVING TOWARD SUSTAINABLE CLOTHING

And McQueen's research is right on the pulse of the move toward more sustainable clothing. In 2014, Levi Strauss & Co. CEO Chip Bergh made headlines when he acknowledged he had yet to wash his favourite pair of raw denim jeans, which he'd been wearing for more than a year.

The international reaction to Bergh's ostensibly shocking denim revelation was part disgust, part fascination. It also created buzz around McQueen's research findings. More than two years earlier, McQueen met Josh Le, an Edmonton student who'd been wearing the same pair of raw denim jeans for 15 months without washing them. McQueen swabbed the dirty jeans, and had Le wash them and wear them for two more weeks. There was no discernible difference in bacteria levels. "The conclusion is, it's environmentally friendly to wash your clothing less often, and not necessarily any dirtier," she says. The research findings garnered international media attention: McQueen and Le did a flurry of media interviews around the world.

McQueen wants people to know there are significant downfalls to washing clothing more frequently. Laundering costs money, wastes water and electricity. And the clothing isn't any cleaner as the jeans study showed; it just wears out more quickly and has to be replaced. "I don't think people fully realize how degrading laundering is to textiles," she says. People over-laundry largely out of habit, she explains, and it's essential to point out the financial benefits of breaking the habit, which can be a bigger motivator than care for the environment alone.

McQueen's desire to arm consumers with knowledge that's good for the environment and their wallets falls right in line with a growing movement toward sustainability in the clothing industry. "We're seeing that across the retail chain," Ankeny says, "where different brands are trying to be good environmental stewards because their customers are interested in the concept of sustainability."

Take the Levi's CEO. In announcing his never-washed jeans, he wasn't just trying to make people cringe. He was using his star power to push the company's sustainability initiative, which encourages the reduced use of energy and water.

"There are things we can do from a manufacturing side of course, but that doesn't always translate or give the consumer any partnership in how they're affecting the environment," Ankeny says. "But if you can let them know, 'hey, your garments are not going to retain odours, you don't have to wash them every time,' that gives the consumer the control on how they approach the environment."

While McQueen's textile research

FABRICS AND BODY ODOUR

is having a global impact, her drive stems from a personal place. McQueen has always been partial to natural fibres like merino, perhaps because of where she grew up; New Zealand is the world's third largest producer of wool, after China and Australia. "Especially for T-shirts and things you wear next to your skin," she says. "You do feel less sweaty in wool. Merino will absorb it so you feel less damp." It's something she's worked out herself over the years. "Some fabrics smell, some don't. I think, if I'm experiencing this, then certainly others are, too."

Her own experiences with body odour in different fabrics sparked her doctoral research at New Zealand's

“In the study I did, there wasn’t any difference in odour control with or without antimicrobials ... It matters to me as a scientist because so many misleading claims are being made, and people believe them. And that frustrates me.”

ODOUR QUEEN: *Textile scientist Rachel McQueen is constantly looking at how fabrics release odour, or not. Her findings have attracted the attention of the textile industry and the international media.*



MICHEL PROULX

University of Otago. From 2003 to 2007, McQueen compared the relationship between body odour and three fabrics: polyester, cotton and merino wool. Sweat itself is odourless, she explains; body odour happens when bacteria on our skin feeds off the sweat and breaks it down into smaller, stinky compounds. And different fabrics have different interactions with the odour and the bacteria. McQueen had male volunteers wear test T-shirts for two days, then conducted odour evaluations on fabric swatches cut out of the T-shirts’ underarms. Smell tests were conducted after one day, seven days and 28 days. Results? Polyester was the smelliest and merino wool was the least smelly. Using microbiology, McQueen also examined

bacteria levels in the fabrics over the 28-day study period. Interestingly, bacteria survived the longest in the merino wool, while it dropped significantly over time in the polyester fabric. “This blew up the myth that wool is antibacterial,” she says.

Why is merino wool less stinky? The research is ongoing, and complex. Wool is more absorbent, McQueen explains; it’s a protein fibre that is more porous than other fibres; also, at its molecular level, it can bind better with odorants. It could also be that wool desorbs more quickly, releasing the odour even if the bacteria remain.

Her odour control research is of great benefit to companies like Designer Textiles International, a New Zealand fabric maker that supplies

merino wool and merino wool blends to big outdoor clothing companies like MEC, SmartWool, Mark’s, Helly Hansen, and North Face. Designer Textiles spokesperson David Carter said the company already knew anecdotally, from people who’ve worn their garments long-term, that merino wool can control odour. McQueen’s research backs them up with hard science.

“Anything we can use as evidence that there is an anti-odour factor from merino wool does help us with marketing,” says Carter. “We believe that, in comparison with polyester, there is a better resilience to body odour in merino wool. We understand that, and it’s an important factor when we sell merino fabrics.”

BEWARE MANUFACTURERS ANTI-ODOUR CLAIMS

Odour is a big deal in the clothing manufacturing industry. A focal point for McQueen's research has been investigating the supposed "anti-odour" capabilities of synthetic garments. Clothing manufacturers make all manner of marketing claims about the anti-smell power of their goods. But the claims can be very misleading, says McQueen. "People think 'Wow, they know their stuff!' And it's complete rubbish."

Synthetic fabrics can be treated or "finished" with antimicrobials such as silver chloride, with the goal of keeping armpit bacteria at bay, she explains. But her studies have shown that, although these antimicrobial mixtures control the bacteria, they do not control the smell. "In the study I did, there wasn't any difference in odour control with or without antimicrobials." Yet even though antimicrobials are only part of the solution, time and time again McQueen sees companies advertising that their garments will keep body odour at bay. "It matters to me as a scientist because so many misleading claims are being made, and people believe them. And that frustrates me."

While McQueen leans toward natural fibres, it doesn't make her biased against synthetics. It makes her want to work harder to find solutions. Polyester is a strong, resilient fibre, she explains, revolutionizing the clothing market in the 1950s, and today it's a huge player on the market, especially in sportswear. "Polyester's not going away," she says. "And for its fibre it's great in many ways. It can be altered and shaped in different ways to enhance wicking." She's keen to figure out what makes polyester make clothing more odorous largely to work towards sustainable solutions. "If you could wash it less

often, that would be fantastic."

Naturally, McQueen's research affects her consumer choices, which is why she's forever reading clothing labels. Fabric content is of particular importance when shopping for her two small children. "I don't like polyester right next to their skins," she notes, especially at night. When people give her hand-me-down synthetic sleepwear, McQueen still puts a cotton T-shirt underneath her son's pyjama top. It's an added layer but he doesn't sleep with the covers on all night, and "without that, he'll sweat more" in polyester alone.

McQueen's passion, at its core, is about tackling everyday problems, helping regular people make consumer choices that save them money and help the environment.

By meticulously unravelling, fibre by fibre, weave by weave, the complex relationship between fabrics and people (both their armpits, and their actions), this textile aficionado's mission is to make us all smarter shoppers (and clothing label readers). Why? If we can choose fabrics sustainably, it's good for our wallets, and the planet. "My research is about making consumers aware of the environmental impacts of laundering your clothes all the time." ♣



THE COST OF WASHING YOUR JEANS

In 2012, following the study in which student Josh Le didn't wash his jeans for 15 months, McQueen investigated the durability of denim when washed frequently versus not.

On average, people expect their jeans to last about five years, she explains. But is that reasonable?

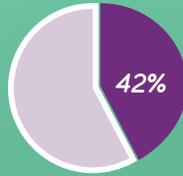
To find out, McQueen had volunteers wear and wash their jeans for about 60 days. They noted the colour and weight of each pair of jeans after 20, 40 and 60 days of use. The fading happened quickly. "It got really clear, the changes in terms of colour," she says. The weight of the jeans also decreased, another sign of deterioration. At the end of the study, McQueen's research assistants cut pieces out of the jeans and tested each swatch for strength, which had also decreased. "This is valuable consumer info," she says. "Even in 60 days, there's a significant decrease in mass and colour."

Sustainability isn't only something we teach in the classroom. With 60,000 people learning, teaching and researching on five campuses, we are 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



42 per cent
WASTE DIVERTED
FROM THE LANDFILL
2015



314 kW
SOLAR ELECTRICITY
& SOLAR THERMAL
2015

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
2015



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
122 KW PHOTOVOLTAIC

2005-06 GHG emissions

2012-13 GHG emissions

2020 GHG emissions goal

Reduce greenhouse gas emissions by 17% below 2005 levels
INSTITUTIONAL GOAL FOR 2020

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GROUND BREAKER

Faculty's first female professor

INSIDE ALES

Wildlife and plants collections

QUOTES

ALES researchers speak up



Singing in the Barn

ALES alumnus-turned-working-country-musician owes his start to the Ag Club

BY HELEN METELLA

One day in the foreseeable future, when rising country musician **Blake Reid** picks up an award for songwriting or singing, the University of Alberta's Agriculture Club may well receive a thank you from the podium.

"Up until my attending the U of A, I would never have chased music as a career," says Reid, whose appealing, cowboy-next-door songwriting was first nurtured by the Ag Club while he was a student in the Faculty of ALES some 25 years ago.

It's since taken him to recording studios in Nashville and to the

main stage of the 2015 Big Valley Jamboree.

A fifth-generation farm kid from a cattle, hay and grain operation in Cremona, Alberta, Reid enrolled in ALES' pre-vet studies in 1990, then switched to crop science three years later. By the time he finished his studies in 1996, his major was environmental conservation.

Early on, he met fellow ALES student and guitarist Todd Schauer.

"We started playing together and resurrected the Agriculture Club band Livestock," says Reid.

"I think it had been around since the '50s and '60s. Back in the day, it was the traditional Aggie band. So there was all this equipment stored in the old meat locker in the livestock pavilion that nobody had used for at least 10 years. There were microphones, speakers, amps. I think there was even an old drum set in there."

Reid and his pals plugged it in and rehearsed in the livestock pavilion, across from the dairy barn on the University Farm. With the addition of classmates Lorne Peterson on drums



MICHEL PROULX

and Brent Lohner playing the fiddle, Livestock was the centre of all Aggie social events — pig roasts, picnics, even several Bar None dances.

“To me, that was the birth of my music,” says Reid, who also began writing songs with Schauer, which they took public as buskers on Whyte Avenue.

Meanwhile, with a repertoire of crowd-pleasers by Alabama, Tom Petty, Steve Earle, the Nitty Gritty Dirt Band and Garth Brooks, plus a dollop of classic country and southern rock, Livestock got a loan from the Ag Club to buy better equipment. After graduation, the band went on the road, playing clubs and rodeos across Alberta and Saskatchewan on weekends, while its members worked agricultural jobs during the week.

For nine years, Reid was a professional agronomist who, on the side, also ran his own farm and a band. Then he expanded into environmental management in the oil patch, while still farming and performing music. In the early 2000s, his music won him four talent contests and prize money of about \$20,000.

“But I always just bought cows,” he says. “I didn’t reinvest in the music.”

However, by 2011, Reid was in the midst of a divorce and felt spread too thin. He disbanded Livestock, rented his farm to a brother and concentrated on a solo career in music.

Shopping his songs in Nashville, he met veteran producer Eddie Gore and recorded his first album, *Against the Grain*, in 2012.

Then several things slid into place at once: *Hell or High Water*, his musical take on southern Alberta’s resilience after the devastating floods of 2013, gained radio airplay and national notice; he was selected as a finalist in the 2013 Canadian Country Music Association Discover Program; and he was invited to be one of six new artists to perform at the CCMA’s Country Music Week that year.

That led to a record deal with Royalty Records, the Edmonton-based

country music label distributed by Sony Music.

In October 2015, Reid released *Rust*, his second album. It was co-written and produced with Nashville studio star Phil O’Donnell who’s written for George Strait and Blake Shelton, among others.

Its production includes a richer texture of influences than his first album, including R&B-driven swamp rock, but Reid’s conversational lyrics still flow easily and his accessible Everyman perspective remains intact.

So far, this album has produced two radio-pleasing singles — *Sounds Like A Song* and *Stay Home* — each of which describe slices of life on the farm with disarming affection.

Being a Canadian country performer isn’t a reliable ticket to economic stability. In 2014, he started his own agriculture consultancy. Harvest Environmental Solutions provides environmental and regulatory expertise to oil and gas producers in Alberta, B.C. and Saskatchewan. It also gives Reid the flexibility to accept music assignments.

Last summer, in addition to the high-profile gig at Big Valley, he landed a string of dates opening for Steve Earle in Manitoba and Saskatchewan.

“He was definitely on my ‘bucket list,’” says Reid, the grin in his voice affirming how much he admires and strives to emulate Earle’s honest, deceptively simple songwriting.

Meanwhile, he’s also formed a partnership with 4-H Canada to help write its centennial anthem, and to perform and engage members during its celebration year, 2016 to 2017.

It’s still tricky balancing two careers and nothing is ever assured, what with cutbacks in the oil patch keeping Reid on his toes. But after observing Earle up close, Reid’s resolve to keep pursuing his own unpretentious brand of songwriting was reinforced: “If you speak from the heart and are yourself without apology, people will appreciate your music.” ■

THE ALUMNI CLUB

EDMONTON

MAY 02, 2015

Encounter snowstorm on evening of departure



MAY 16, 2015

East of Tobin Lake, SK: Start fishing

Lake Winnipegosis: Wind blows tent off its pegs, with 5 year-old Mali inside

JUNE 07, 2015

Winnipeg River: Paddling upstream for the first time

JULY 02, 2015

JULY 08, 2015

Ontario-Manitoba border: Mali catches first fish on his own

Five months 4,200 kms: cross-Canada canoe adventure

BY HELEN METELLA

For the first 103 days of their ambitious trip by canoe from Edmonton to Montreal, ALES alumnus **Benoit Gendreau-Berthiaume**, his wife and five-year-old son might not have agreed on the adventure's most challenging point.

There had been a few.

His wife, Magali Moffat, would have likely cited a wild wave on Lake Winnipegosis that nearly capsized them while Gendreau-Berthiaume's attention was focused on a map. Their son, Mali, might have mentioned a fierce overnight wind that pulled up ground pegs and sent their tent airborne with the little boy still inside. Upbeat Gendreau-Berthiaume, '15 PhD (Forest Ecology), a lifelong paddler who became completely comfortable in the wilderness while earning his degrees, probably would have described the conflict of juggling his roles as attentive father, husband and expedition leader.

But on August 13, 2015 they encountered the journey's biggest test.

The trio was trudging the Grand Portage on their way to Lake Superior. The 13.7-kilometre trail in northeastern Minnesota has allowed travelers to bypass Pigeon River's rapids since at least the late 1600s, but its terrain is hardly benign.

Already battling 35 C temperatures

and canopies of bugs, they discovered that the small wooden bridges along the trail were too narrow for their loaded-with-gear canoe cart. So they had to unpack and reload it repeatedly — 40 or 50 times, recalled Gendreau-Berthiaume with a telling head-shake several months later.

Earlier that day, Moffat rolled her ankle and Gendreau-Berthiaume stepped on a rusty nail, piercing a foot already infected by poison ivy. Later, a massive turtle blocked their path for quite some time, hastily snapping in half the thick-as-his-arm stick Gendreau-Berthiaume used to prod it. Finally, after nearly fainting from fatigue and dehydration, Gendreau-Berthiaume made another distressing discovery that was confirmed to him the next day. A doctor in a town beyond the portage diagnosed him with a 2.5-metre tapeworm, possibly contracted from undercooked fish consumed early in the five-month trip.

"I was in disbelief," says Gendreau-Berthiaume. "I had just been through a hell of a day, I was worried about tetanus, and I thought, 'OK, what's next?'"

Next was another 44 days of paddling, portaging and bowing to nature's unpredictability — hello, scary Lake Nipissing — before they stepped ashore in Montreal

with all their goals accomplished.

They'd marked the end of Gendreau-Berthiaume's five years at the University of Alberta with a flourish, shared a pivotal family event and immersed themselves in Canada's beauty via historic voyageur routes.

"The areas where we felt the most alone are probably the areas we enjoyed the most," says Gendreau-Berthiaume.

"There was a section in Manitoba where we didn't see any human life for 10 days and that was very special, feeling abandoned to yourself, having to figure out ways to deal ... that sense of wilderness with so many birds and wildlife coming from everywhere."

As he watched Mali discover edible plants, wildlife, learn how to fish, calculate distance, problem solve and share responsibilities, the trip reinforced Gendreau-Berthiaume's belief in the importance of spending time in nature.

While the adults were already experienced in rugged outdoor life — Moffat is an accomplished rock climber — they picked up new knowledge, too.

"We grew extremely appreciative of the water quality, having to depend on the water of the land," Gendreau-Berthiaume says, explaining they were soon able to discern differences



Kenora ON: GPS Dies.
Navigation done with maps
and compass for next 10
days before getting new GPS

JULY 18, 2015



Lake Superior:
Complete the gruelling
14-km Grand Portage

AUG 13, 2015



French River:
Reach the most
beautiful area of
the trip

SEPT 03, 2015

Quebec: Reach
home province

SEPT 13, 2015



SEPT 09, 2015

Lake Nipissing:
Face biggest waves

SEPT 26, 2015

Home!

MONTREAL

in the taste of water they filtered from various lakes, rivers and streams.

Keeping a small child happy for five months spent mostly on the water proved less difficult than imagined, as Mali became proficient at sleeping away hours on the moving canoe.

While the fieldwork hours Gendreau-Berthiaume amassed while studying forestry meant he felt confident handling such standard wilderness issues as bear sightings and ferocious bugs, his degree also came in handy in less expected ways.

"One of the things that helped me most through grad studies was being able to organize big projects, and one of the biggest challenges of this trip was the organizing, the time it took to find funding and sponsors."

Those duties continue. During the

trip, the family constantly shot film footage they plan to compile for a documentary they're making with a filmmaker in Canmore — even as Gendreau-Berthiaume takes up a post-doctoral position at the *Institut des sciences de la forêt tempérée*, a research institute attached to the Gatineau campus of the *Université du Québec en Outaouais*, where he'll be studying the impact of forestry roads on biodiversity.

To finance the film, the couple has set up a crowdfunding campaign on the GoFundMe site and both have already booked corporate speeches and appearances to help defray production costs. Recently, Gendreau-Berthiaume gave a keynote address at the Greater Edmonton Teachers' Conference last February.

As to their next adventure? Moffat has vetoed another canoe marathon but, "We saw a lot of sailboats on Lake Huron and my wife and I developed a bit of curiosity about them," says Gendreau-Berthiaume. "Maybe we'll get into sailing in a bigger way."

Whatever the next adventure, paddling so far with just the day-to-day essentials has left an impression that guarantees there will indeed be a similar voyage.

"Coming back from this trip, repacking our house to move (to Gatineau), we were asking ourselves, what are we doing with all this stuff?" said Gendreau-Berthiaume.

"That's one thing that will stick to us for a long time — buying things is unnecessary. We'd rather invest in adventures." ▀

ALES alumna receives top Commonwealth award for bravery

Triathlete and mother of two saved couple from ocean's riptide

BY HELEN METELLA

When Tamara Loiselle decided to plunge into the ocean off Cancun to save a young couple in distress, she was propelled by what she calls a very quiet, still voice inside her head saying, "Go ... just go."

"It came from an intuitive place," says the 43-year-old ALES alumna, '95 BSc (ENCS) and '01 MA Psychology. "Yes, it was a calculated risk and yes, I did have lifeguard training (as a child), but really, I wanted to stay on the beach where it was safe."

Yet the single mom of two did go, swimming out with a life preserver and a rope around her waist that was secured by condo resort staff on the beach. She rescued a Montreal couple in their 30s who had been dragged out some 60 metres by the riptide and

had exhausted themselves trying to fight their way back to shore amidst high waves.

For that, Loiselle received the Mountbatten Medal from Alberta's Lt.-Gov. Lois Mitchell in a ceremony last October in which the Royal Life Saving Society recognized her feat as the most courageous rescue or rescue attempt executed in any Commonwealth country in 2014.

The rescue's harrowing aspects included Loiselle's rope getting tangled in the on-shore reel, preventing her from moving forward for a few moments. The woman she saved was so spent she had already resigned herself to dying, so Loiselle grabbed her hand and held it fiercely to the life preserver, only to have a massive wave dislodge both the woman and man's hold on the flotation device.

But perhaps the most remarkable part of this tale concerns the events that led to Loiselle being able to help at that exact moment, a story-behind-the-story that's revealed in the book *Divine Impulse*, which she's written and published in January.

December 29, 2014 was the last day of Loiselle's vacation, one in which she'd slept in late each day.

But that morning she woke up well before 7:30 a.m., with a Gaelic blessing running through her head. It's the one that starts, "May the road rise up to meet you, may the wind be always at your back." She's not especially religious and can't explain why words

she hadn't thought about in 20 years were on her mind.

But since they were now awake, Loiselle and her friend headed out for a morning stroll.

"We had just come out of the building and were still on the pool deck when all I heard was a man screaming for help and I saw two black specks on the water," she says.

She ran to the beach and instantly realized that no one else there had the physical skills she had — skills developed in the seven years since she'd fallen from a boat off the B.C. coast and nearly drowned.

Back then, lacking the strength to pull herself aboard and seeing the terror in her daughter's eyes, "I made myself a promise that if I survived I'd get myself into shape."

In fact, she fulfilled that promise so well, she's now an accomplished triathlete.

Since the rescue, Loiselle has been doing speaking engagements, stressing how important it is to "trust your gut instinct, that inner voice that tells you what to do, against all odds."

As the president of her own consultancy, Tamarack Strategies, she provides environmental training programs and services to Aboriginal communities. But the experience in Cancun has her considering the questions she's now presenting to others in her speeches.

"Is there a bigger plan for my life, am I being called in a certain direction and do I have the confidence to do that?"



SUPPLIED

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.

FAMILY MEMBERS

“Without them, the health and continuing care system, the public system, would collapse.”

Janet Fast, an economist and gerontologist in Human Ecology, CBC, 21/12/15
Commenting on the critical service provided by family members who provide caregiving.



COYOTE FEAST

“We've laid the table for them, food-wise.”

Lee Foote, director of the Devonian Botanic Garden, Yahoo News 2/07/15
Explaining that coyotes venture into urban neighbourhoods to eat things that contain nutrients for them — everything from human food waste and compost piles to dog feces left lying in yards.

THE NEXT BIG THING

“(The bio-industry) has the economic potential to one day rival the oil and gas sector by aligning and transforming the agricultural, forestry, chemical, biotechnological and energy sectors.”

Stan Blade, dean of the Faculty, Edmonton Journal, 8/12/15
In an op-ed piece about the opportunity for Alberta to lead the development of the bio-industry.

THE BIRDS

“I think probably for every crow that I see in the wintertime, I see maybe 1,000 ravens.”

John Acorn, entomologist, Edmonton Journal, 7/02/16
Commenting on the increasing population of ravens in Edmonton.

THE NEED FOR RAIN

“We need a 15 per cent increase in precipitation to account for the warming. Very few climate models suggest there will be an increase in precipitation to compensate.”

Mike Flannigan, a professor of wildland fires in Renewable Resources, Climate Central, 01/07/15
Explaining that warmer temperatures are the prime driver of forest fires in boreal forests and there's not enough extra rain.





TRAIL BLAZER: Mary Spencer, seen here with her husband Hank, joined ALES in 1962 and developed a stellar reputation in research and teaching.



Forging a trail for women in academia

ALES' first female faculty member, plant scientist Mary Spencer, was an international authority on ethylene and a 'fabulous' teacher

BY HELEN METELLA

When Mary Spencer left one of the world's leading universities in the field of plant science to teach plant biochemistry at the University of Alberta in 1953, some, er ... adjustments were necessary.

"There wasn't a lot of research money," she said recently, comparing it wistfully to the well-funded research she'd left behind at the United States

Department of Agriculture and her teaching position at the University of California, Berkeley (each abandoned over unease with McCarthy-era politics).

Certainly there wasn't \$5,000 for a flame photometer, a then-new tool for analyzing very small amounts of chemicals, which Spencer needed to continue her studies on the flavour of

tomatoes. So her husband Hank, an engineer, built one from scratch.

"I put him to good use," she said softly, with a smile and a wink.

No doubt, that combination of scientific focus and gentle pragmatism helped Spencer become a star of science, in a career that lasted almost 50 years.

As an international authority on

ethylene—including its effects on plant ripening, on the environment, and her breakthrough discovery that it's emitted by the human body—Spencer earned a lengthy list of science honours. Additionally, she's a Member of the Order of Canada and recipient of the Queen's Golden and Diamond Jubilee Medals (2002 and 2012).

She was the first female faculty member in what is now ALES, which she joined in 1962 from the Department of Biochemistry in the Faculty of Medicine, where she'd been an acting department head. She'd already worked in industry in Canada and the U.S., but found her calling at the university.

"She was a fabulous teacher," remembered William Vanden Born, a former chair of the plant sciences department, who met her as an undergrad and later became a colleague. "She knew her stuff and presented it quite clearly."

As a woman professor, there were obstacles: "You'd see it on the salary levels, the promotions, the loads you had to carry, everything," said Spencer simply.

Her daughter Susan remembers that some people disapproved right up until her mother's retirement in 1989. Yet in 1976, Spencer became the first academic member on the university's board of governors, and was given the distinction of university professor in 1984.

As a scientist, in the 1970s Spencer was one of the first two women appointed to the National Research Council, where she served two terms, advising on biology and chairing a committee on forestry research. By 1976, she was elected a Fellow of the Royal Society of Canada, a body of distinguished scientists and scholars selected by their peers for their outstanding contributions. During the 1980s, she also served two terms on the National Sciences and Engineering Research Council of Canada.

"She was a woman scientist who was successful before her time, successful early on, and recognized as such," said Forrest Tittle, one of her post-doctoral researchers in the 1980s.

Her reputation for research was stellar, remembered Fenton McHardy, a former dean of the Faculty of Agriculture. Her appointments to the NRC, NSERC and the Royal Society, where she reviewed grant applications and set research directions, were proof of that.

"Those positions weren't popularity contests," he said. "Appointments were decided on the basis of a person's performance."

Spencer's ability to probe the true significance of the proposed work in grant applications was an important asset that stems from her skill as a writer, said Tittle.

"When you're preparing articles for publication in a scientific journal you need to get to the point and use words that convey precise meanings," he said. "She was a very good writer, and clear writing in science is critical because clear writing leads to clear thinking ... she was a clear thinker."

Spencer had once contemplated an English degree but as a child of the Depression she believed that chemistry provided better job prospects.

After obtaining a BA with high honours in chemistry from the University of Saskatchewan, she earned her MA in chemistry from Bryn Mawr College in Pennsylvania, and then a PhD from UC Berkeley, where she launched her study of ethylene.

"Ethylene was a reactive simple compound that was quite important in California," she said, explaining her interest. "It was a really open field, not a lot was known about it and the results of the studies would be put to use immediately."

Among other things, Spencer's research examined relationships

between carbon dioxide and ethylene production in a series of plant systems.

"A lot of the work predated or coincided with some of the first molecular biology work and DNA work, which superseded it," said Tittle. "But it was a good foundation and it gave us some insight on where to look when we had the tools to do so."

Still, a couple of years ago, an Australian researcher looking for a cancer cure contacted her, thinking some genetics experiments she'd conducted might hold an answer, said Susan Spencer. Spencer's influence has extended beyond her lab in other ways, too.

"One might argue that her well-recognized research results were exceeded by the training and development she gave to her students," said Ian Duncan, her lab technologist from 1973 to 1994. "Many of her post docs went on to exceptional careers."

Among them are Tittle, now Dean of the School of Sustainable Building and Environmental Management at NAIT, and Deep Saini, vice-president at the University of Toronto and principal of its Mississauga campus. Spencer's reputation drew Saini from the University of Adelaide to work with her.

"Professor Spencer was rare among her contemporaries in giving almost complete freedom to her post docs to explore new ideas and go wherever their curiosity took them," said Saini. "This ... provided a fertile environment in which to learn the skills that would prove pivotal for my future."

Spencer didn't initially dream of teaching; her daughter suggests her shyness made it unappealing.

"But I think she came to the realization that if you had two hours a week for 13 weeks you could teach something really big and worthwhile. That would have been right up her alley." ■



TWENTY QUESTIONS

Meet the new money woman

Marie Perron was appointed the faculty's new Assistant Dean, Development, in January. A one-time tree planter, Marie is an accomplished fundraiser who joined the U of A in 2012. Originally from Sherbrooke, QC, she earned a bachelor of commerce from McGill before moving to Medicine Hat and then Edmonton. Marie and her husband Kyle live in Edmonton with their 5-old daughter, Mia.

In order to get to know Marie a little better, and to see how things are going in her new job, *Greenhouse* asked her the following 20 questions. Turns out she's quite the foodie, an excellent fit with our faculty!

Your idea of perfect happiness?

Time with my family outside, at a lake, by a river, in the forest, at the beach ...

Your greatest fear?

Not having food when I get hungry.

Trait you most deplore in others?

Lack of enthusiasm. If you undertake a project, it should be with energy and enthusiasm.

Living person you most admire?

I'm new ... should I say Dean Blade?!

Your greatest extravagance?

Food – when I'm hungry, there is no limit to what I'll pay for what I want to eat in that moment. I love food and I like to try new things.

Your current state of mind?

Time for a snack.

The most overrated virtue?

Humility. As Canadians, we are naturally humble, which makes a collaborative society. But it can also mean that we don't celebrate the successes that we should. Over the years, I have met many alumni who deserve more praise, but we fail to celebrate them because they have been overly humble.

Words or phrases you most overuse?

"What?!" In disbelief. Loudly.

Greatest love of your life?

Close tie between my husband and daughter.

Talent would you most like to have?

To be a good cook!

One thing you'd change about yourself if you could?

Pronouncing the "th" sound better. It is a tough task for this French girl!

Your most marked characteristic?

Enthusiasm

What you most value in your friends?

Positive attitude

Your heroes in real life?

My grandfathers. They are hardworking, curious, smart, and funny!

About being assistant dean... you've been on the job for about three weeks.

How do you describe your new job?

A privilege to accompany supporters who want to improve our world, and see ALES as a provider of solutions.

Is it what you expected?

Yes. And even better as I had forgotten how great it is to be among students on a daily basis and witness their energy and desire to improve the world.

The biggest surprise?

The bathroom near my office will be closed for the next two months! ... so nothing too alarming.

Your favourite thing about it?

So far, attending the McGregor Smith Student Speaking Competition. Those students are eager to make our world better and they're ready to put into action the knowledge they've learned.

Your least favourite thing about it?

The paperwork! But it is necessary, and deserves to be done well. ♣

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.

Tangy Beef Stew

Ingredients:

2 tbsp	all-purpose flour
¼ tsp	salt
1/8 tsp	pepper
1 lb	stewing beef, cut into 1-inch cubes
1½ tsp	canola oil
½ cup	water
¼ cup	ketchup
2 tbsp	brown sugar
2 tbsp	vinegar
1½ tsp	Worcestershire sauce
½	large onion
¼	green pepper, cut in strips
1½	carrots, sliced
1½	potatoes, cubed

Directions:

1. In a bowl, combine flour, salt and pepper. Coat beef with mixture.
2. In a large skillet, heat canola oil and brown meat on all sides.
3. In another bowl, combine water, ketchup, brown sugar, vinegar and Worcestershire sauce. Stir into browned meat. Add onion; cover. Cook over low heat for 45 minutes, stirring occasionally. Add remaining vegetables. Cook until meat and vegetables are tender, approximately 45 minutes.

Serves 5 (serving size 1 cup)

Per serving: 293 kcal, 10g fat, 3g saturated fat, 23g carbohydrate, 2g fibre, 29g protein



An insider's look at some of the faculty's treasures. In this issue, we look at the Department of Renewable Resources' Cy Hampson Wildlife Collection and Dendrology Collection.

Natural history treasures

Faculty houses impressive wildlife and woody plants collections

BY HELEN METELLA

From the hall, almost anyone would mistake it for another nondescript classroom tucked into a corner of the General Services Building, but room 769 is actually a priceless lab stuffed with two fabulous resources.

One is the Cy Hampson Wildlife Collection of preserved mammals and birds; the other is the Dendrology Collection of woody plants. Together these natural history collections contain thousands of specimens essential for a thorough grounding in forestry and environmental conservation.

As well as being an international expert on flying squirrels, a wildlife photographer, author, filmmaker and a professor of outdoor education at the University of Alberta in the 1950s, biologist Cy Hampson was an avid taxidermist.

"As a hobby, he would gather animals that had been accidentally killed," said naturalist John Acorn, who relies heavily on the Hampson collection to teach a course on wildlife biodiversity to second-year students in the Department of Renewable Resources.

The nearly 1,000 specimens that Hampson produced, beginning in the 1920s, range from a majestic Great Horned Owl in flight position to skulls of opossums and skins of rodents. There are many full mounts of rabbits, geese, ducks, porcupine and small birds, too.

"Cy was very skilled," said Acorn. "The taxidermy is very good. All the specimens look alive, with lifelike facial expressions. They're not lumpy or strange looking."

That authenticity is vital for students learning to identify different species groups.

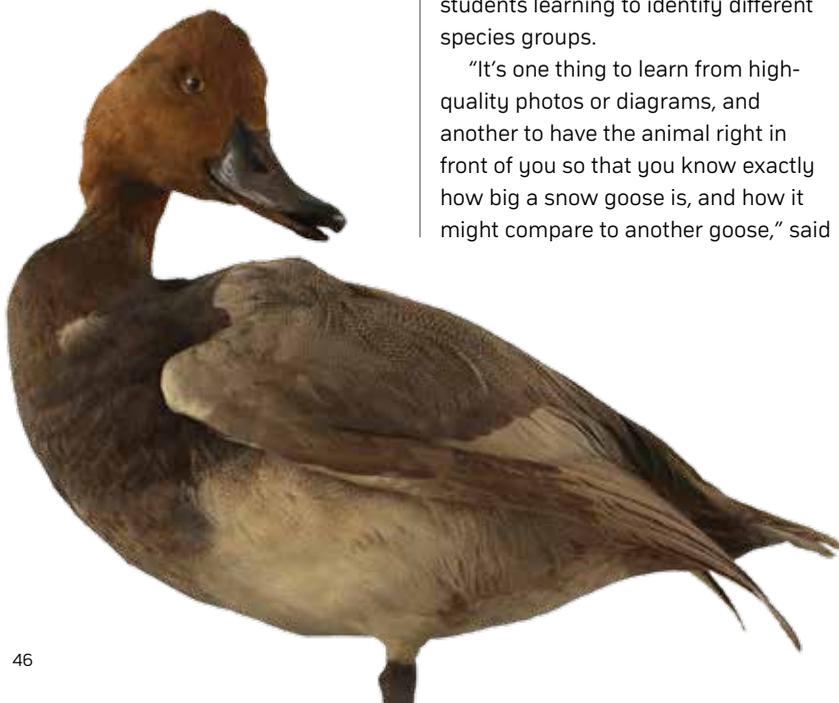
"It's one thing to learn from high-quality photos or diagrams, and another to have the animal right in front of you so that you know exactly how big a snow goose is, and how it might compare to another goose," said



Acorn. "And increasingly, we have a lot of international students. While in the past we could say, 'You all know what a robin or a Canada goose looks like,' we can't say that now."

Expert taxidermy also provides details of individual features that define a group.

"Sometimes that can be fiddly, like the arrangement of toes, or the bristles that some birds have around their mouth," said Acorn. "You might not



WILDLIFE AND LEAVES: At left, and clockwise from there: a redhead duck; leaves from trembling aspen; a badger; a variety of tropical cicadas and plant hoppers and; the skull of a black bear.



notice that looking at a photograph.”

The comprehensive range of this collection makes it an irreplaceable teaching tool. While hunters still create a demand for the taxidermy of game animals, and some collectors like to mount birds of prey, other groups that are important to study, like shore birds, aren't likely to be preserved at all, said Acorn.

“You don't walk into a house and see a mount of a gull. This collection has the full diversity.”

Hampson, who died in 1997, donated his collection to the Faculty of Education. It was acquired by the Department of Renewable Resources about a decade ago. Since then, it has doubled in size with the addition of

almost 1,000 pinned insects that Acorn has assembled. It now represents the full spectrum of animal life.

The Dendrology Collection, which is housed on the walls and in drawers around the lab, is equally impressive. The “Dendro,” as it's affectionately known, is a collection of woody plants from North America that's particularly complete on western Canada's species. Its 1,000-plus items include leaves, needles and stems mounted behind glass on large panels, traditional herbarium sheets, as well as fruits, seeds, cones and bark.

Bruce Dancik, a professor emeritus who was chair of Department of Forest Science and of its successor, Renewable Resources, started the

collection in 1973.

Many of its specimens were gathered by teaching assistants and students who were encouraged to collect materials during their summer field jobs, said Dancik, in order to better remember the 160 species they studied each year. But one of its most notable contributors was his friend Bill Critchfield, a pioneer research scientist with the U.S. Forest Service in California. He arranged for the Pacific Northwest Research Centre in Placerville, Ca., a world leader in natural resources research, to send many samples from California and the Pacific northwest.

Some highlights of those are specimens from giant redwood trees and several enormous pine cones.

“The sugar pine is the largest white pine in the world and it has massive cones that are very long,” said Dancik. “And two short pines, the Coulter pine and digger pine, have cones that can weigh three or four kilograms.”

The Dendro helps environmental conservation students identify all elements of ecological systems so they can approach problem solving with confidence.

“The first thing you do when you arrive at a field site is look around and assess, what kind of an ecosystem am I in?” said Acorn. “And you can tell that by the trees.”



ALES 100

The year that was

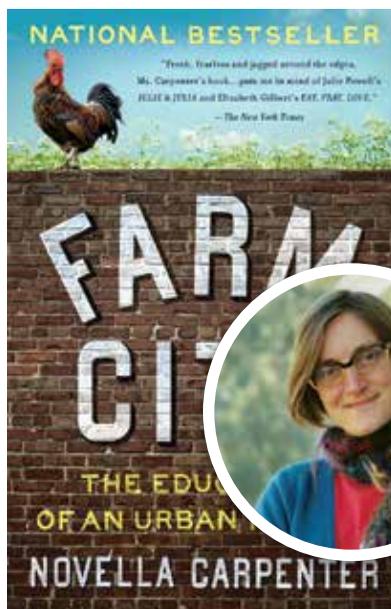
It only comes around once every 100 years and the Faculty of ALES seized the opportunity to celebrate its Centennial in grand style during 2015. It all started in the fall of 2014 with opening ceremonies that featured a panel discussion moderated by the Rt. Hon. Kim Campbell and featuring former premier Ed Stelmach, ALES alumnus Jim Hole and ALES professors Janet Fast and William Shotyk. The 400-plus guests who attended the event were also treated to an entertaining 20-minute skit and song about ALES first century. And it only got better as the year went on.



▲ **Opening ceremonies**
The Rt. Hon. Kim Campbell moderated a fascinating panel discussion (really!) during our ALES Centennial Opening Ceremonies. "ALES is where it's at!" she said. She was right!
October 2014

► **Bar None Endowment Fund hits milestone** During its first 15 years, the Bar None Endowment Fund has provided 599 scholarships and awards to deserving ALES students. A remarkable achievement!
November 2015

► **Getting to know the land** We had a spectacular (and hot!) hosting more than 150 people at the Mattheis Ranch Field Day to talk about grazing, biodiversity, soils and much more.
July 2015



▲ **ALES students read up on urban ag**
Urban gardener Novella Carpenter's book *Farm City* was at the heart of ALES' Common Reading program in which more than 300 students participated!
February 2015

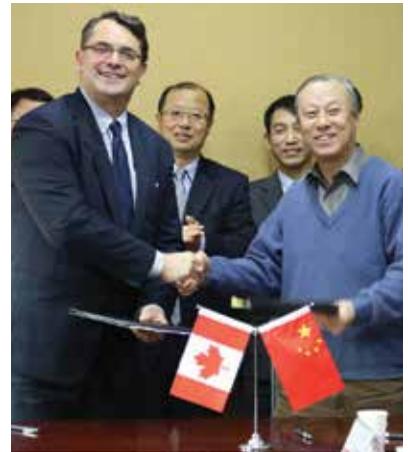
▼ **Luminaria** shined again at the Devonian Botanic Garden on a crisp December weekend. A spectacularly beautiful event
December 2015





◀ **ALES Ale** Thanks to our great friends at Olds College, we celebrated our centennial with “ALES Ale,” a very tasty brew. 2015

▼ **Growing our international connections** Continuing our tradition of building strong international relationships, ALES signed two major agreements to establish joint research centres with top Chinese universities. January 2015



▼ **Meeting the new minister** Senior ALES leadership met with newly-minted Minister of Agriculture and Forestry, Oneil Carlier, to discuss shared interests less than a month after being appointed. June 2015

▶ **Connected to the community** Two out of three ain't bad: ALES received two of the three UAlberta Community Connections Awards, one for the legendary Jack Francis, founder and curator of the ALES Museum, and another for our famous and ever-popular Heritage Chicken Program. July 2015



PAUL SWANSON



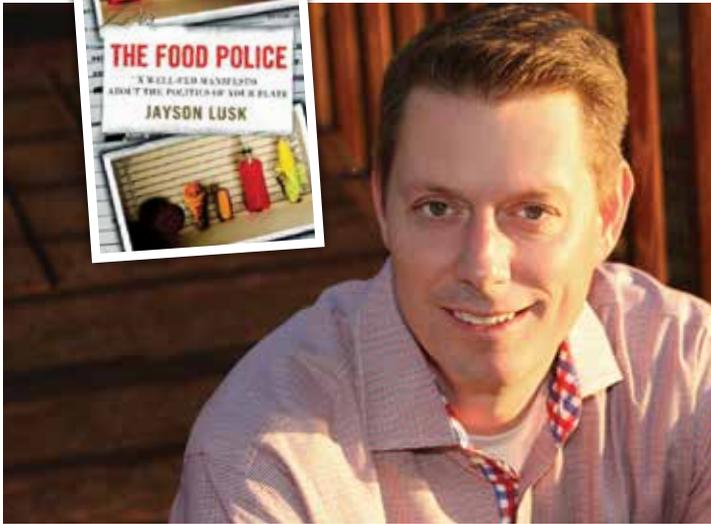
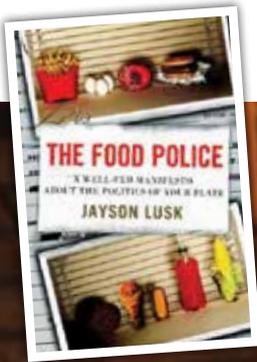
RICHARD SIEMENS



THE ALUMNI CLUB

► **A new herd for Roy Berg Kinsella Research Station** Distinguished U of A Alumni Award winner Senator Dan Hays and his wife Kathy donated their herd of Hays Converters and a major cash gift to maintain and care for the herd. *September 2015*

▼ **Are you sure about that?** Food economist and author of *The Food Police*, Jayson Lusk, challenged our assumptions about the benefits of the food system during a lively public lecture. *February 2015*

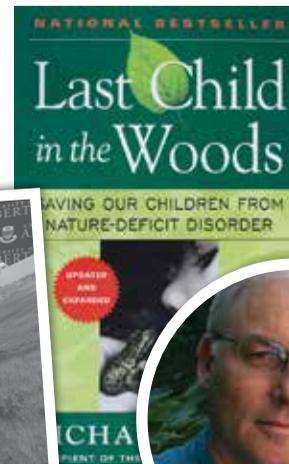


▼ **Quilts reflect history** The curator of the International Quilt Study Centre Museum, Caroline Doucet, discussed how quilts reveal gaps in history during the annual Empey Lecture. *March 2015*



▼ **Tackling chronic diseases** World-renowned nutrition researcher and ALES alumnus, Harvey Anderson, connects the dots between agriculture, the food system and our health. *October 2015*

▼ **Preserving the Mattheis Ranch forever** Partnering with Western Sky Land Trust, ALES announced a \$3.8 million conservation easement on the Mattheis Ranch, which guarantees its preservation forever. *March 2015*



▲ **The power of nature** The remarkable Richard Louv, author of *Last Child in the Woods*, talked about nature deficit disorder and how nature nurtures us. *March 2015*





▶ **ASTech winners** Two big wins for ALES at the annual ASTech awards, Alberta's most prestigious science awards: the Breton Plots Management Group won the Innovation in Agriculture Science Award while the Lipid Chemistry Group took the Outstanding Achievement in Applied technology and Innovation Award *November 2015*

◀ **Convocation 2015** Likely the biggest highlight of our Centennial: we held our very own convocation to celebrate 100 years of success! With more than 250 graduating students, and all the pomp and circumstance, it was a spectacular affair! *June 2015*



◀ **Welcoming President Turpin the ALES way** Among the gifts offered President David Turpin and his wife Suromitra Sanatani at an event to welcome them to the U of A are two books — the *Pure Prairie Eating Plan* and *A Century of Solutions* — and, of course, a six-pack of ALES Ale! *December 2015*

▼ **A first for the Dean's Breakfast** The annual Dean's Breakfast was held on South Campus where a record crowd of more than 200 alumni and friends ate breakfast in a tent. *September 2015*



◀ **The ALES 100 Old Country Fair** More than 1,400 school kids and 500 adults attended the ALES Old Country Fair on South Campus during Alumni Weekend! *September 2015*

▶ **Connecting sustainable food with biodiversity** Jason Clay from the World Wildlife Fund launched our Centennial Lecture Series with a fascinating talk about producing more sustainable food while maintaining the planet. *December 2014*



IN MEMORIAM

Former dean oversaw construction of the Ag/For Centre

BY HELEN METELLA



John Bowland, a former dean and professor of animal nutrition specializing in swine, died last December. He was 91.

An accomplished animal scientist who served as dean from 1975 to 1983, Bowland is best remembered for overseeing the planning and construction of the Agriculture/Forestry Centre.

“He was quite meticulous, a good organizer who got on well with everybody,” remembered Mick Price, a fellow professor emeritus of animal science.

That conscientiousness is manifest in the proper name of the Ag/For building, as it is colloquially known and which opened in 1981.

“He insisted on it being called the Agriculture/Forestry Centre, never Agriculture and Forestry,” said Price, who speculated that the dean wanted to emphasize that the foresters, who had become part of a merged faculty in 1971, were important equals.

Among Bowland’s other notable contributions was the establishment of the Farming for the Future program in 1979. It made funds available from the Alberta Heritage Savings Trust Fund for agriculture researchers to do applied research.

The fund emphasized projects that had a practical outcome for farmers and received far more robust provincial funding than had been previously forthcoming from the federal government, said Robert Christopherson, another former animal science colleague.

“It was a way of kick-starting a new era of research funding,” he said.

Bowland’s own research helped the pork industry identify which amino acids in feed were critical for growth.

Bowland is also remembered affectionately for entertaining every professor in the faculty at his house, every year, by inviting groups of six or eight to dine virtually every Sunday. “That was an outstanding thing to do,” said Price.

A celebration of his life will be held on April 1, from 3 to 5 pm., at the University of Alberta Faculty Club. ♣

IN MEMORIAM

Remembering Sten Berg '54 BSc (Ag)

BY RON MCCULLOUGH '54 BSc (Ag)

Some persons growing up in the Eastern Irrigation District of Alberta seem to have special attributes – independence, determination, hard-working, resourceful, sometimes stubborn – and Sten Berg was no exception. He had all of these good traits and more.

As teenagers, the Berg boys were a competitive force in 4-H circles. Sten’s late brother Roy stated that Sten was the best athlete in the family. His classmates of the Ag Class of '54 also remember his musical abilities, playing piano, guitar, accordion and mouth organ during the 1950s and at many social gatherings since.

Arguably one of the best travelled of the Aggies of '54, he was often hired by foreign governments as a resource consultant/planner, including a major resource study in the Himalayan region of China.

At home, he gave liberally of his leadership. As a councillor on Strathcona County Council, he successfully opposed Edmonton’s plans to build a landfill in northeast Edmonton.

He chaired both the Alberta Hog Producers Marketing Board and the Alberta Cattle Commission at various times. During Alberta’s Centennial year, in 2005, he became one of Alberta’s 100 named ambassadors. Premier Lougheed had earlier appointed Sten as a director of the Alberta Export Agency.

But that’s not all. The University of Alberta named Sten as one of five



IN MEMORIAM

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

PHYLLIS MARGARET BODARD

'34 BSc (HEc)
in May 2015

**BARBARA MARY S. LANGFELDT
(JARMAN)**

'37 BSc (HEc)
of Toronto, ON, in January 2015

**MARJORIE LOUISE JONES
(LEGATE)**

'42 BSc (HEc)
of Calgary, AB, in March 2015

SHIRLEY J. JACQUES (AULD)

'46 BSc (HEc)
of Calgary, AB, in June 2015

DORIS ISABEL MORRISON (HILL)

'46 BSc (HEc)
of Victoria, BC, in August 2015

**JEAN STEWART MONTGOMERY
(SMITH)**

'49 BSc (HEc)
of Edmonton, AB, in March 2015

DORIS ELAINE ALGER

'50 BSc (HEc)
of Calgary, AB, in August 2015

PETER FRANK MELNYK

'50 BSc(Ag)
of Victoria, BC, in April 2015

DONALD GORDON MURCHIE

'51 BSc(Ag) '71 Dip(Ed)
of Edmonton, AB, in April 2015

ANDREW VLADIMUR ANTONIUK

'52 BSc(Ag)
of Edmonton, AB, in June 2015

DENNIS EDWARD DUGGAN

'53 BSc(Ag)
of Atlanta, GA, in June 2015

HUBERT GORDON PUFFER

'56 BSc (Ag), '66 Dip (Ed)
of St. Albert, AB, in June 2015

R. LESLIE THOMAS

'57 BSc (Ag), '59 MSc
of Guelph, ON, in March 2015

KENNETH MAXWELL MORTON

'58 BSc (Ag)
of Red Deer, AB, in May 2015

CLARENCE JOHN ROTH

'59 BSc (Ag)
of Surrey, BC, in September 2015

LILLIAN C. SHARP

'61 BSc (HEc)
of Edmonton, AB, in April 2015

DOUGLAS HENRY WALTER JOY

'70 BSc (Ag)
'73 BEd, of Ardrossan, AB, in July
2015

AIME JOSEPH AURIAT

'78 BSc (Ag)
of Edson, AB, in April 2015

ROBERT BRUCE MACMILLAN

'79 BSc (Forest)
of St. Albert, AB, in April 2015

HELEN JANE MACZALA (SADGROVE)

'87 BSc (AgEng)
of Peace River, AB, in February 2015

BLAIR PIERRE J. PIGEON

'92 BSc (Forest)
of Duncan, BC, in March 2015

Alumni Award winners selected from our class of 19 graduates. He was cited for his innovative practices in hog breeding and production management, leading to maximum growth and feed efficiency.

Sten was instrumental in changing the Canadian hog grading system to promote leaner production and in starting the Pork Organization of Canada (PORC). In their 20 years producing hogs and cattle, they pioneered several new concepts, including foetal transplantation.

Much credit must go to his wife of 61 years, Elspeth! She was a full partner throughout his life, including keeping the farm going when he traveled.

We salute you, Sten!

Rest in peace, good soldier of agriculture. 🍀

AFTERGRAD

Life's unexpected destinations

BY **GORDON EADIE**, '05, BSc (ENCS)
AS TOLD TO **HELEN METELLA**

I live and work nowadays in Falun, Sweden, where I am an educational farmer at a county-run farm and outdoor education centre. I essentially farm a heritage site in a green area on the edge of a city of 50,000 people.

I first went to Sweden on exchange in 2004 for one semester at Uppsala University. I met my wife there and ended up staying. I studied at the Swedish University of Agricultural Sciences and then did a master's of education in Sweden. I initially worked as a teachers' substitute, and in 2010, I got this job. I'm certainly one of very few people in the world with my job. It's perfect for me.

The Falun Nature School where I work is like a combination of Edmonton's Bennett Centre, Strathcona Wilderness Centre, Ukrainian Heritage Village and a 4-H farm. We provide hands-on learning experiences for all schools within the county focusing on world heritage, local history and sustainable development.

As part of our programing, we run an educational farm. It consists of small-scale farming and forestry that combines historical and modern methods to engage Falun's students and inhabitants in both the production of goods and environmental stewardship. In addition to school classes that come almost daily, we see 10,000 visitors annually for public activities.

My job includes managing 50 hectares of reforested historical farmland that make up the heritage



SUPPLIED

site, creating educational opportunities for visitors to the farm and providing job training for people who have different rehabilitation programs. I find the job training particularly rewarding. I work with youth placements, people with different types of handicaps and people who have been away from the job market for social reasons.

My resolve to work within the field of environmental education began while I studied at U of A. During my years at ALES, I worked at the Devonian Botanic Garden and several other organizations that offered environmental education or interpretive services.

In this job as an educational farmer, I'm working with education in a real-life

setting where things are tangible.

I'm also involved with a series of methodology books that give examples of activities that teachers can do for specific subjects using outdoor education (www.outdoorteaching.com/en.) Outdoor learning is about engaging physically in learning to enhance memory. Using extra senses provides more cues for recalling and remembering. I also co-authored a book in Swedish about outdoor education for sustainable development.

Thanks in part to my education in ALES, and some of the opportunities it provided me outside the classroom, I'm closer to my ideal job than I ever dreamed of being. ■

GET OUT HERE!

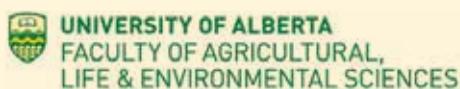
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DevonianBotanicGarden



