University of Saskatchewan

# Agknowledge

COLLEGE OF AGRICULTURE AND BIORESOURCES 01 | 08

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COLLEGE OF AGRICULTURE AND BIORESOURCES 02 | 07

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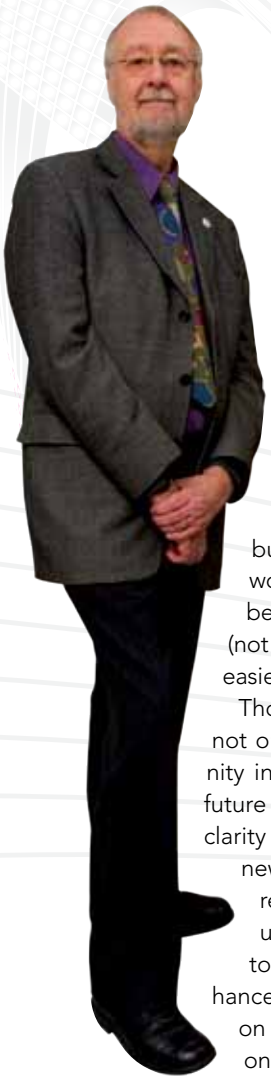


# IN WITH THE NEW

## MESSAGE FROM DEAN SCOLES

When a change in the name of the College was first suggested and since June 2006 when that change was approved, we have had considerable discussion with our stakeholders and alumni about our vision for the future. Some voiced concern that in redefining ourselves, we might lose sight of our traditional roots, but with continued discussion and with words such as *bio-economy* and *bioproducts* becoming more widely used and understood (not to mention high oil prices), it has become easier to explain the reason for the change.

Those discussions have proven invaluable, not only because they've brought our community into a lively discourse about the College's future but because they've brought even greater clarity to our refreshed mandate. To clarify: our new mission is that through our teaching and research we will advance the responsible use of land, water and biological resources to provide products and services that enhance the quality of life. This mandate is based on the fact that we must increasingly depend on the world's biological resources to provide our needs. In one sense, this mission takes us back to before the industrial revolution; in another, it is a compelling vision of a sustainable future and represents a significant opportunity for our students and our province.

In whatever way we choose to plot our path forward, rest assured we will continue to draw upon our recognized history in agricultural research. The body of knowledge residing in our College comprises the very roots of our authority, providing us with the opportunity to take a leadership role in the emerging bio-economy. And although we cannot see the precise outlines of our future, we are more confident than ever that with this strong foundation beneath us, the College of Agriculture and Bioresources will continue as an international leader in applied research and scholarship.

You'll read more in the pages to follow of our new initiatives and the progress we've made over the past year. We now have students in the second year of a new degree for the College – the Bachelor of Science in Agribusiness. Another degree program, the Bachelor of Science in Renewable Resource Management, was approved at University Council in November. After so many years as a college offering a single degree, this change in our programming has forced us to stretch our imaginations and our resources. The results have been welcome as they've brought us new faculty and students whose enthusiasm for our direction is contagious.

Another significant step forward this past year was the development of two proposals that form part of our 2008 to 2012 Integrated Plan submission. Building on the Certificate in Indigenous Peoples Resource Management Program (funded by Indian and Northern Affairs Canada), we have proposed the establishment of an Indigenous Land Management Institute (ILMI). This Institute will perform research and train graduate students, and also help us to offer undergraduate training beyond the certificate level through a diploma and eventually a degree program.

Also in 2007, we stated our intention to establish ourselves as a major bio-economy centre for North America. It is clear to us that because we already have so much of the talent and resources necessary to facilitate a centre of this kind, our college is the obvious choice for such an initiative. We are fortunate too in that our discussions with the Province of Saskatchewan on this and other proposed programs have been so fruitful: the government has supported us generously with investments in our infrastructure and our people. I can tell you that this is a relationship other universities in Canada envy and admire.

You will note the theme of this issue of *Agknowledge* is 'international exchange', and that the stories herein take us from Saskatchewan to Mongolia, China, Peru, Ethiopia, Japan, Sweden, India, the U.S., and back again. We have our faculty and students to thank for this creative trading of knowledge between universities and nations: it is mainly due to their initiative and energy that such fruitful interchange is possible.

Best wishes for a successful 2008.

Graham Scoles

# FACULTY RENEWAL

## NEW FACULTY WELCOMED TO THE COLLEGE

As the College of Agriculture and Bioresources evolves, so do our people. Since the year 2000, we have seen almost half our senior members retire and, while we regret that drain of expertise and maturity, we simultaneously look to a new generation of academics to lead us into the future. Among those recently welcomed as new faculty members are:

**Professor Angela Bedard-Haughn**
Department of Soil Science

**Joined U of S:** July 1, 2006
Academic Background: BSc in Physical Geography from University of Saskatchewan, 1998; MSc in Soil Science from University of Saskatchewan, 2001; PhD in Soil Science from University of California at Davis, 2004
**Focus of Work:** Relationships between soil carbon and nitrogen dynamics and land use and climate change
**Passion:** "I work in Applied Pedology, which examines how land use and climate change affect, and are affected by, basic soil properties and processes in Canadian ecosystems. Soil carbon and nitrogen are at the interface of land use and climate change – they are required for plant growth, but in excess they contribute to many of our current environmental problems. Detailed studies of the ecosystem and management variables that control carbon and nitrogen cycling will improve our understanding of what governs the availability and mobility of these nutrients. Currently, my research group is combining multi-scale fieldwork and stable isotope techniques (13C and 15N) to quantify nitrogen cycling rates and nitrous oxide emissions in the prairies and boreal forest and to relate organic matter characteristics in Arctic soils to their potential to act as a sink or source for greenhouse gases."

**Professor David C. Natcher**
Department of Bioresource Policy, Business and Economics

**Joined U of S:** July 1, 2007
Academic Background: PhD from University of Alberta, June, 1999
**Focus of Work:** Human Dimensions of Environmental Management, Indigenous Land Tenure, Political Ecology, Common Property
**Passion:** "My training and professional experience lie predominantly in political ecology, indigenous peoples of the circumpolar region, indigenous rights, and resource and community development. My experience has been cultivated through applied research partnerships with indigenous communities in Alaska and Canada where I have had the opportunity to research and publish on the various challenges faced by indigenous peoples, the changing northern economy, and the strategies employed by indigenous and other resource dependent communities to deal effectively with social, political and environmental change. By working directly with indigenous resource users, tribal governments, federal, state and provincial government agencies, Alaska Native Corporations, and resource development industries, I have gained considerable insight on indigenous systems of land tenure. I am thrilled to have joined the University of Saskatchewan and to have the opportunity to collaborate with students and faculty from across the campus."

**Professor Curtis J. Pozniak**
Crop Development Centre, Department of Plant Sciences

**Joined U of S:** January 1, 2003
Academic background: BSA from University of Saskatchewan 1999, PhD from University of Saskatchewan 2003
**Focus of Work:** Genetics, breeding and production of durum and high-yielding spring wheat
**Passion:** "My research interests are studying the genetics of important disease resistance and end-use quality traits in durum and high-yielding wheat, and applying the knowledge generated to improve wheat varieties for Western Canadian producers. A major thrust of my work is the development and application of the latest genomics and molecular technology to wheat improvement, particularly for critical end-use quality and disease resistance traits. Basic research and breeding efforts to enhance nutritional components of durum wheat are a top priority as society becomes more conscious of the foods they eat. Research into improving wheat as biofuel feedstock and its co-products for the livestock industry are expanding. New varieties for the biofuels industry will lead to alternative local markets for producers and improve the competitive position of wheat producers, and increase economic returns to Saskatchewan."

# STUDENT AWARDS 07/08

AGBIO UNDERGRADS OF TAKE THE WORLD BY STORM

## ENTRANCE AWARDS

**Agribition Award**
Carla Schmitt, Arborfield

**Arnold & Emily Robinson Scholarship**
Marcy Grywacheski, Norquay

**Beatrice Murray Entrance Scholarship**
Kimberly Hardy, Grenfell

**Canada Wide Science Fair Matching Scholarship**
Kara Nadeau, Fannystelle. MB
Brittany Faye, Foam Lake

**Canadian Wheat Board Diploma Entrance Scholarship**
Kelsey Dust, Humboldt
Kyle Esquirol, Edam
Gareth Hodges, Dalmeny

**Douglas Christie Ferguson Fund Scholarship**
Alison Foth, Hague
Kaila Hamilton, Radisson
Ashley Sutherland, Prince Albert

**Robert and Maude Hale Scholarship**
Lee Crosson, Welwyn

**Heather Haeusler Memorial Entrance Scholarship**
Jenny Soucy, Arborfield

**Jim Anderson Entrance Scholarship**
Matthieu Bauche, Redvers
Daniel Stark, Mossbank
Adam Thorson, Penzance

**College of Agriculture and Bioresources Renewable Entrance Scholarship**
Gillian Dobson, Meadow Lake
Amy Larre, St. Walburg
Jamie Paul, Saskatoon
Bradley Pohler, Spalding
Meagen Reed, Kindersley

**College of Agriculture and Bioresources Entrance Scholarship**
Darren Bacon, Dodsland
Brittany Faye, Foam Lake
Raea Gooding, Saskatoon
Lyndsay Hauber, Cudworth
Elizabeth Jahnke, Morse
Gina Kelln, Strasbourg
Savanagh Kobylak, Sonningdale
Caitlin Labach, Saskatoon
Amanda Libke, Hanley
Jocelyn Loos, Moose Jaw
Katie MacMillan, Asquith
Cheralyne Martens, Rabbit Lake
Romy Poisson, Shaunavon
Brittney Schurmann, Abbotsford, BC
Brandon Sparrow, Vanscoy
Megan Taupadel, Paradise Hill
Brett Tollefson, Mossbank
Andrew Weisberg, Melfort
Courtney Zabolotney, Viceroy

## CONTINUING STUDENT AWARDS

**Adeline and William Haberman Memorial Scholarship**
Leah Fullerton, Lacadena

**Albert and Beatrice Trew Memorial Scholarship**
Danielle Roy, Regina

**Bert Hargrave Scholarship**
Bonita McCuaig, Eastend
Danielle Roy, Regina

**Saskatoon Chamber of Commerce Bert Salloum Scholarship in Agricultural Economics**
Oteng Modongo, Saskatoon

**Brent Ganzer Memorial Scholarship**
Oteng Modongo, Saskatoon

**Canadian Prairie Lily Society Scholarship in Horticulture**
Tyler Kaban, Yorkton

**Canadian Prairie Lily Society T.A. (Andy) Dingwall Scholarship in Horticulture**
Hanny Elsadr, North York, ON

**Canadian Society of Animal Science Book Prize**
Tamara Bogdan, North Battleford

**Canadian Wheat Board Undergraduate Awards Program**
Brooke Aitken, Eyebrow
Thalia Bradford, Allan
Timothy Chalk, Radisson
Brandon Edgar, Wolseley
Elliott Hildebrand, Rabbit Lake
Russell Lawrence, Saskatoon
Kyle Mackow, Chaplin
Kelci Ottenbreit, Grayson
Leo Perlinger, Handel
Jaclyn Prystupa, Saskatoon
Stacey Spenst, Waldeck
Jocelyn Stefankiw, Regina
Danielle Stephens, Balcarres

**College of Agriculture and Bioresources Renewable Entrance Scholarships, Second Year**
Jill Keet, Grandora
Bonita McCuaig, Eastend
Kaitlin Strobbe, Saskatoon

**College of Agriculture and Bioresources Renewable Entrance Scholarships, Third Year**
Jennifer Bentz, Saskatoon
Alana DeBusschere, Melfort
Archie Robertson, Swift Current

**College of Agriculture and Bioresources Renewable Entrance Scholarships, Fourth Year**
Brittany Chovin, Vanscoy
Jenna Drinkwater, Saskatoon
Jessica Forrester, Saskatoon
Laura Hoffman, Bruno

**College of Agriculture and Bioresources Renewable Transfer Scholarship**
Cara Drury, Saskatoon
Nicole Hylkema, Chilliwack, BC
Bethany L'Heureux, Saskatoon
Andrea Stone, Loreburn
Breanne Wilson, Tugaske
Tracy Meyer, Woking, AB
Bronwyn Ragetli, Whitehorse, Yukon

**David J. Welch Memorial Prize**
Francois Begrand, St. Louis
Colby Sproat, Kipling

**Dollie Hantelman Agricultural Scholarship**
Francois Begrand, St. Louis
Rory Gregoire, North Battleford
Jerred Henderson, Lucky Lake
Kaitlyn Kaspar, Outlook
Lindsay Kohl, Mankota

**Dow Agrosciences Scholarship in Agriculture**
Jacqueline Beatty, Yorkton
Vanessa Seymour, Saskatoon

**E.W. McKenzie Scholarship**
Cara Drury, Saskatoon
Archie Robertson, Swift Current

**Ewald M. & Donna I. Kitsch Scholarship in Crop Science**
Derek Berg, Hagen

**F. J Fear Scholarship in Soil Science**
Jenna-Lee Heska, Surrey, BC

**Frank & Freda Riecken Scholarship in Soil Science**
Vanessa Seymour, Saskatoon

**Gillian Hughes Memorial Travel Fellowship**
Alana DeBusschere, Melfort

**Robert & Maude Hale Scholarship**
Kristen Zacharias, Saskatoon

**Harvey Scholarship**
Songshan Bao, Beijing, China
Rhian Beever, Rivers, MB
Tamara Bogdan, North Battleford
Dayle Borchardt, Biggar
Misaki Cho, Regina
Rachel Claassen, Saskatoon
Sabrina de Baat, Burnaby, BC
Janelle Fouhse, Saskatoon
Catherine Miller, Ponoka, AB
Roberta Templeton, Coaldale, AB

**The Bayer CropScience InVigor Anniversary Scholarship 2007**
Sarah Anderson, Sceptre
Jeff Bennett, Dodsland
Kyla Cutts, Saskatoon
Chad Ferguson, Naicam
Kyle Mackow, Chaplin
Bronwyn Ragetli, White Horse, Yukon
Kaitlin Strobbe, Saskatoon
Roberta Templeton, Coaldale, AB
Bailey Wilmot, Carnduff
Landon Zimmer, Luseland

**James Donald Hardin Scholarship**
Wayne Ferguson, Theodore
Erin Jackson, Inglis, MB
Andrea Ross, Verwood

**Jickling Agricultural Scholarship**
Colleen Redlick, Biggar

**Joe McClughan Scholarship in Agriculture**
Oarabile Kgosisejo, Saskatoon
Matthew Malyk, Airdrie, AB

**John and Laura Morris Agricultural Scholarship**
Jenna Drinkwater, Saskatoon

**John Mitchell Memorial Scholarship**
Kristen Zacharias, Saskatoon

**Kelly Aulie Memorial Scholarship**
Alison Higgins, Saskatoon

**Larry Janzen Memorial Scholarship**
Graham Beddome, Prince Albert

**Molson Canada Book Prize**
Jeff Lindsay, Nipawin
Danielle Roy, Regina

**Rossnagel Scholarship for Academic Improvement**
Jacqueline Beatty, Yorkton

**Russell Fisher Scholarship**
Ryan Goodwin, McCord

**Saskatchewan Canola Development Commission Scholarship**
Alana DeBusschere, Melfort
Kimberly Ede, La Ronge
Brenden Freeden, Dundurn
Colby Sproat, Kipling

**Saskatchewan Institute of Agrologists Scholarship**
Leigh Anderson, Hendon
Leah Fullerton, Lacadena
Tracy Meyer, Woking, AB
Colby Sproat, Kipling

**SaskPower Shand Greenhouse Education Prize**
Hanny Elsadr, North York, ON

**Syngenta Achievement Award**
Stacey Dunn, Saskatoon

**Pat Toderian Scholarship**
Brooke Aitken, Eyebrow
Tamara Bogdan, North Battleford

**University of Saskatchewan Scholarship**
Jennifer Bentz, Saskatoon
Brittany Chovin, Vanscoy
Laura Hoffman, Bruno
Bronwyn Ragetli, Whitehorse, Yukon
Bethany Yewsuk, Wynyard

**University Undergraduate Scholarship**
Blake Balog, Milk River, AB
Francois Begrand, St. Louis
Kyla Cutts, Saskatoon
Nikki Gannon, Saskatoon
John Hildebrand, Rabbit Lake
Kristen Zacharias, Saskatoon

**Vancouver Port Authority**
Jessica Forrester, Saskatoon

**W.J. Copeland Scholarship in Crop Science**
Jenna Drinkwater, Saskatoon

**Walter Scott Scholarship**
Derek Tallon, Lafleche

**William G. Barclay Scholarship in Agriculture**
Stephanie Meier, Ridgedale

## GRADUATION AWARDS

**Animal Nutrition Association of Canada (Alberta Division) Scholarship**
Melissa Johnson

**Farm Credit Canada Business Planning Diploma Award -1st Place**
Ryan Carter, Saskatoon
Ryan Goodwin, McCord
Joel Marchildon, Zenon Park
Landon Zimmer, Luseland

**2nd Place**
Pauline Bolay, Fairford, MB
Jamie Freedman, Gronlid
Kurtis Kramer, Avonhurst
Andrew O'Reilly, Scout Lake

**Farm Credit Canada Business Planning B.S.A. Award -1st Place**
Karen Bowditch, Sylvania
Lorelei Gress, Tisdale
Adele McIntosh, Brandon, MB
Shanda Sedgwick, Elrose

**2nd Place**
Leigh Anderson, Hendon
Amanda Hoehn, Prince Albert
Jeremy Olthof, Granum, AB
Glenn Stacey, Tisdale

**William Allen Prize in Agricultural Economics**
Andrew Laing, Regina

**Fulton Family/Saskatchewan Institute of Agrologists Prize**
Pauline Bolay, Fairford, MB

**Molson Canada Award of Excellence**
Kimberly Wood, Prince Albert

**Norman H. Pearce Prize in Animal & Poultry Science**
Chelsey Carruthers, Biggar
Lee-Anne Walter, Lampman

**Saskatchewan Horticultural Association Prize**
Adithya Ramachandran, Safat, Kuwait

**Saskatchewan Institute of Agrologists Gold Medal**
Nadia Mori, Switzerland

**Frank Sosulski Graduation Prize in Plant Sciences**
Sean Miller, Avonlea

**P.M. & Y.Y. Huang Distinguished Undergraduate Award in Soil Science**
Karlah Rudolph, Gull Lake

**Westgen Scholarship**
Lee-Anne Walter

## POSTGRADUATE AWARDS

**Agro Class of '43 60th Anniversary Award**
Gwinyai Chibisa

**Canadian Dairy Commission Scholarship**
Kimberly Wood
Ningning (Helen) Zou

**Dollie Hantelman Scholarship**
Sangeeta Dalal
Kiran Doranalli
Mohammad Shakeri Hosseinabad
Lindsay Oiffer
Jie Qiu
Lasantha Ubayasena
Sally Vail
Zhihua (Rachel) Xiao
Hossein Zakeri

**L.H. Hantelman Award**
Harsha Marambe

**Barbara and Frank Pavelich Scholarship in Soil Science**
Christian Dedzoe

**Canadian Wheat Board Graduate Fellowships**
Houtain Ge
Jamie Partridge
Lee-Anne Walter

**Canadian Wheat Board Postgraduate Award in Agricultural Economics**
Lyndon Lisitza, Porcupine Plain

**F.V. MacHardy Graduate Fellowship in Grasslands Management**
Nadia Mori

**Graduate Fellowship in Grasslands Ecology**
Nadia Mori

**Harris and Lauretta and Raymond Earl Parr Memorial Scholarship**
Sushama Arya
Samira Bakhshi
Rejesh Jha
Aziz ur Rehman
Sherisse Reimer
Mohammad Tahir
Lasantha Ubayasena

**J.D. MacFarlane Postgraduate Scholarship**
Brad Pinno

**John Baerg Scholarship Trust**
William Reid

**John Blake Memorial Postgraduate Scholarship**
Akal Rachna Kaur Saini

**Maurice Hanson Sr. Scholarship**
Maxime Pare

**Molson Canada Scholarship**
Sinisa Vidovic

**Norman and Kathleen Lean Postgraduate Scholarship**
Nityananda Khanal
Lasantha Ubayasena

**Sask Pulse Growers' A.E. Slinkard Scholarship**
Aziz ur Rehman

**Syngenta Scholarship in Sustainable Agriculture**
Joel Ens

**Putman Family Memorial Award**
Samira Bakhshi
Mohammad Shakeri Hosseinabad

**Purdy Postgraduate Scholarship**
Nityananda Khanal

**Wickhorst Memorial Scholarship**
Graeme Mansfield
Amy Sangster

**C. Paul W. and Marianne M. Ziehlke Award**
Adekunbi Adeleke
Nadia Mori
Rose Whelan

**O. M. Elviss Scholarship**
Adekunbi Adeleke

**Paulden F. and Dorathea I. Knowles Scholarship**
Eric Asare
Leah Fedoruk
Sushmita Mitra

**R.P. Knowles Scholarship**
Nicole Seerey
Warren Ward

**Pedersen Scholarship**
Morgan Jaster
Tom King

**Rene Vandeveld Postgraduate Scholarship in Crop Science**
Asim Biswas
Josephine Kusuma
Anula Perera
Akal Rachna Kaur Saini

**Roderick Alan McLean Memorial Award**
Biligetu
Sushmita Mitra

**Saskatchewan Pulse Crop Development Board Don Jaques Memorial Fellowship**
Lasantha Ubayasena

**S. N. Horner Graduate Scholarship**
Jola Pisz

**Warburtons Award in Agriculture**
Rajender Singh

**Weetman Scholarship**
Adam Gillespie
Ryan Hangs
Morgan Jaster

# AGBIO SCHOLARSHIP TRUST FUND "WALL"

07/08 RECIPIENTS OF RENEWABLE SCHOLARSHIPS

# EXCHANGE IS GOOD

## AGBIO STUDENTS TRAVEL OVERSEAS TO PURSUE STUDIES

It's the proverbial opportunity of a lifetime: the chance to pursue your studies, take advantage of university funding – and see the world while you're at it.

Undergraduates of the College of Agriculture and Bioresources have leapt at that opportunity over the past few years by participating not only in the university's formal student exchange program but in numerous other hands-on field camps and short-term junkets organized by their own professors. This year, five students will spend a term abroad, six will participate in a study tour to Ethiopia, and others will have an opportunity to take a class in China.

"This collection of international programs is part of the College's commitment to experiential learning," says Student Services & Academic Programs Co-ordinator Karen Hughes.

"Our goal is to provide funding to help undergraduates get the chance to leave home for anywhere from a month to a full term, while learning about agricultural practices in very different parts of the world."

One such young traveller is Agbio grad Courtney Boryski, who spent the first six months of 2006 at the Swedish University of Agricultural Sciences in Uppsala.

The Nordic country wasn't her first exchange-program choice, but she soon discovered Uppsala was "a clean, historic, safe and beautiful city with about 150,000 residents and 60,000 students. The majority of students there spoke English, and even people who weren't fluent still wanted to practice their English with me."

An environmental focus was key throughout her Swedish studies. "Although I've always thought our U of S program offered a healthy combination of economics and environmental priorities, the Swedish was just that much more green.

"Even in the student dorms, we were constantly separating our garbage into paper, plastic, tin and glass bins – we even had our own composting system."

The program (as well as a two-month stint of backpacking through Europe once her studies in Sweden were complete) gave her a real taste for overseas experience – plus it hasn't done her resume any harm. Shortly after graduating, Courtney landed a job as a merchandiser for Archer Daniels Midland (ADM) Corporation, a Fortune 100 company and one of the world's largest processors of soybeans, corn, wheat and cocoa.

"ADM has offices all over the world, including Europe, Asia, North and South America. My goal will be to get a job in international oil sales with the company, preferably in one of their European offices, and I'm hoping my exchange experience will give me a leg up as I pursue that goal."

Crop science major Barrett Rankin completed a fall term in 2004 at Sweden's Umea Universitat; once he acquainted himself with the city and its campus, "I came out of my shell. Some of the Swedish students were charged with mentoring us – taking us to buy groceries, going to hockey games and karaoke nights. That made a huge difference."

Another unexpected difference was the discrepancy in study culture, he says. "Classes here at U of S are typically an hour or so long, but in Sweden, we went every day from 8:30 a.m. to 4:00 or 5:00 in the afternoon, with lectures and labs right through the day. Very intense."

Barrett followed up his Swedish program with a month-long trip to Ethiopia in May 2006, funded by the Canadian International Development Agency (CIDA). Culture shock dominated this learning experience.

"Because the country exists in so many different elevations and temperatures, there is incredible diversity in its agriculture – sorghum and other drought-tolerant crops in the lowlands while in the highlands, you see corn, peas and teff (a wheat-like crop). "Then you'd find yourself in a city with nice office buildings and you turn the corner and there's a bull running down the street."

The Ethiopia program in particular opened his eyes, he notes. "Since coming home, I've thought quite a bit about going back to work in Africa, perhaps with an agency like UNICEF. I would never have thought of pursuing a career overseas if it hadn't been for these two programs."

Unlike Barrett, Terri Lynn Paulson has been thinking for a long time about devoting her life to agricultural work in developing countries. The fifth-year crop science major participated in her first international experience in May 2005 on a U of S combination Arts and Science/AgBio study tour to Cuba, "where we spent the first week studying Cuba's culture, and the second week examining Cuba's agricultural systems, which involve some unique/innovative organic and urban agriculture practices."

She too was part of the 2006 student tour of Ethiopia. "Looking back, I think that Cuba gave me an introduction to traveling outside of my comfort zone, and Ethiopia gave me a chance to truly embrace that as part of the adventure, and embrace the learning experience of being in another culture.

"I'm from Foam Lake, Saskatchewan, where you can drive for hours on farm roads and never see a soul. In Ethiopia, you can't go anywhere without seeing people everywhere you look.

> ***"If I can find the right opportunity, I may try to go back to Africa..."***

"Although it may seem arrogant as an advantaged white student to want to help solve Ethiopian problems, the country reinforced my desire to pursue international work as a vocation. If I can find the right opportunity, I may try to go back to Africa," she says.

As for students who take advantage of the U of S's international programs, "I can guarantee you'll learn a lot of things about yourself and what you want to do when you 'grow up.' These are the things you cannot possibly learn from textbooks.

"To my way of thinking, there truly is no classroom like the world."

# BIO-BUSINESS

## FIRST STEPS TO A NEW KIND OF BOOM

Establishing the College of Agriculture and Bioresources as a North American bio-economy centre is a major focus for the college in coming years, say senior AgBio academics.

That goal is possible because "we have literally everything in place at the University of Saskatchewan to make it so," says Agriculture and Bioresources College Acting Dean Graham Scoles.

"On the campus itself, we have the complete cluster of life sciences – everything from agriculture and biosciences, engineering and business to medicine, pharmacy and veterinary sciences.

"In addition, we work with a significant group of industry players, either on this campus at Innovation Place or very close by," he adds. "These organizations include Agriculture and Agrifood Canada, and AgWest Bio, to name just a few."

Indeed, Scoles notes the Conference Board of Canada recently completed a major review of the entire bioresources industry and concluded that "going forward, we are the obvious choice for a bio-economy centre. Clearly, we have the people and the resources to make this compelling vision a reality."

With those assets firmly behind it, the College of Agriculture and Bioresources has joined forces with the Edwards School of Business and the College of Engineering to develop a bio-economy centre at the U of S. Dr. Bernard Laarveld, professor with the University of Saskatchewan's College of Agriculture and Bioresources, is the lead for the project.

Knowing that the concept of bio-economy is an unfamiliar or obscure one for many laypeople, he describes it as "a new industry that provides sustainable economic benefits by using renewable biomass production, processing and refining to produce bio-energy and bioproducts.

"It's important to remember that these products include not only industrial but also health-related products and services."

Laarveld says the emergence of bio-economy as a new model is driven by a number of factors: first, growing public concern about the environment, climate change and the need for sustainable resource management; second, the recognition that fossil fuels are finite and their supply increasingly insecure; third, the accelerating growth of the world economy and its accompanying demand for energy, food and bioproducts.

"We also see major business and economic opportunities in the emerging bio-economy through the industry's introduction of 'green' products and services," he says. "On top of that, we see the bio-economy providing diversification and rejuvenation of the rural economy in Saskatchewan."

He notes that one of the main challenges facing the proposed centre is a need to emphasize commercialization and research aligned with industry need.

"We'll do this by focusing on the demand-pull approach of commercialization of technology by establishing public/private partnerships at early stages of the innovation cycle.

"Continued industry and investor involvement throughout the innovation cycle ensures research efficiency and effective commercialization. Once applied to the bio-economy, this 'demand pull' principle should ensure that technology transfers are more collaborative, creative and successful," he notes.

"The public/private partnering and demand-pull commercialization will attract increased investment as the research performed will be better targeted to the end user with much greater assurance of success, thus lowering investment risk. You can imagine how this integration of forces would considerably speed up progress in bio-economy technology."

> ***"We have a strong vision and great opportunities ahead for our faculty and students."***

Partnering with Bernard Laarveld in the proposed centre is the university's new Dean of Engineering, Dr. Janusz Kozinski. He agrees Canada could benefit from a stronger link between business and academia.

"But if you're going to have collaboration, it has to be a meaningful and equal partnership," he urges. "Whatever else we do, our research community in Canada must become more business focused and really concentrate on commercialization."

Kozinski sees obvious synergies between the traditionally warring factions of fossil fuel and biofuel producers, "for one because Canada's future energy portfolio must be properly balanced and diversified. There is obviously a role for petroleum in our future, and there is likely a role for nuclear energy here too, especially when you consider the fact that in Saskatchewan we have 70 per cent of the world's high-quality uranium reserves. And there is of course a place for biofuels and bio-energy."

Why this diversity and not simply a clean break into the bio-economy? "Because I think in the near term we have to put our major emphasis on efficiencies," says Laarveld.

"Ethanol won't simply replace gasoline – that'll never happen. Our greatest challenge today is thinking more strategically and in terms of multi-faceted fuel supply. That's why it is important to develop partnerships with energy companies in Alberta, to gauge their level of interest and see how we might work together."

But there is one point on which Professor Laarveld is not willing to bend: "Saskatchewan was the first in Canada to bring in an ethanol mandate, so we already have the research capacity and the history to take a confident lead in this new industry."

Dean Scoles agrees. "When you're talking about bio-economy, you're thinking in terms of land and resources – and let's remember that Saskatchewan has approximately 45 per cent of the arable land in Canada as well as enormous forestry resources in the northern part of the province.

"We're also seeing significant interest in bio-economy from both the federal and provincial governments, whose collective aim is to stimulate activity in this area through networking and attracting private players to the industry.

"We have a strong vision and great opportunities ahead for our faculty and students. It's a great time to be focusing on bio-economy."

# A BRIDGE TO CHINA

## BUILDING ON A STRONGER RELATIONSHIP WITH THE SLEEPING GIANT

A long-standing relationship with China's agricultural universities has recently evolved into a significant opportunity for the College of Agriculture and Bioresources, says its dean.

"We've trained many Chinese graduate students at the College over the years, but we are now beginning to define a plan to educate their senior undergraduate students here as well," says Acting Dean Graham Scoles, also a molecular geneticist and plant sciences professor at the university.

"A second component in our plan is a potential exchange of faculty: they have people who want to study in Canada and, similarly, we have people who would be delighted to spend a short period of time at a Chinese university.

"I see the potential for collaboration between our universities as extremely productive and exciting."

Scoles explains that the usual route for Chinese graduate students to the University of Saskatchewan begins as it does for every grad student: with an application and request for funding. "Traditionally, grad students would be provided funding by stipends from professors or through university/college scholarships in order to be able to afford to study in Canada."

He notes that while the Chinese standard of living is still only about only a fifth of the Canadian norm, "especially when it comes to salaries," some of China's universities and the parents of some Chinese students now have sufficient funding to support their own best-and-brightest graduate and undergraduate students in a foreign academic setting.

"When you have a population of 1.3 billion people, your universities are able to draw from a large financial base," he notes. "China sees numerous challenges and opportunities ahead for its people, and it's no longer shy about pursuing educational options for its talent."

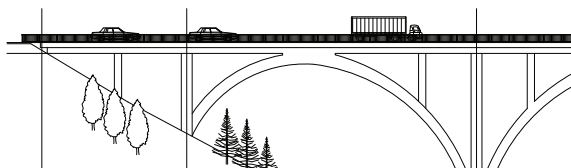
But as noted, graduate students are not the only ones considered for the exchange, says Scoles. "I've been talking to Chinese administrators who are interested in a 'two-plus-two' program for their senior agriculture undergraduates. These students would complete two years of undergraduate studies in China, then transfer here for the remaining two.

"What's even better is that these young students are extremely motivated and keen, and their parents anxious to support them in every way – and that includes financial support."

Scoles says there are over 60 agricultural universities in China; in the past few months, he's visited the China Agriculture University in Beijing ("the top agriculture school in the country"), Jilin Agriculture University in Changchun and Shenyang Agriculture University, and he's been in contact with others. He believes these contacts must be maintained on an annual basis to make the linkages work and expects faculty will want to create their own research collaborations with Chinese scholars.

"We now have a fairly well-worn path between our two countries, and I find their people very open to new opportunities for co-operation.

"In fact, many of the senior people in these universities graduated from the University of Saskatchewan back in the 1960s and '70s. It's wonderful to meet these folks as I tour their universities – they clearly look back at their time in Saskatoon with great fondness."



# AGRICULTURE SHOCK

## CULTURES COME TOGETHER TO BENEFIT A NATION

Mike Grevers is happy to help burst all the old stereotypes of Ethiopia – "all those media-created images we see of desolate, dry and sandy plains and children with swollen bellies.The country is so much more rich and diverse than that."

Besides his role in the College's Department of Soil Sciences, Grevers is the Canadian project leader of a five-year $1.4 million Canadian International Development Agency (CIDA) project to establish a graduate MSc program in agriculture at Hawassa University in Awassa, Ethiopia. He's traveled to the African country each year during the past seven years, and while he's no longer completely surprised by what he sees there, he doesn't mind watching the reactions of Ag-Bio faculty and students who've been lucky enough to accompany him.

"I'm a bit immune to it but I know one of the first things to strike visitors is the enormous number of people who surround you wherever you go in Ethiopia," he says. "That and the poverty, of course – poverty and illnesses like leprosy and blindness.

"But there's also extraordinary richness in the landscape, from geological anomalies like the Great Rift Valley, which is a narrow low-elevation strip full of lakes, to higher elevations that are lush and green. The variety of soils and animals living in the country is equally diverse and intriguing."

Grevers notes the Ethiopian government has embarked on an aggressive program to build university and technical colleges across Ethiopia, which involves training people there to take on research and teaching roles; "that's where our CIDA project comes in," he says. "The faculty who've gone with me so far have helped develop and teach graduate courses, and supervise graduate students there."

While male Ethiopian graduate students can typically find a sponsor to help pay their living and scholarly expenses, female grad students tend to have a worse time of it. "We have a scholarship fund for the women in these programs, as otherwise they find it tremendously difficult to complete their studies.

"As well, we try to bring with us textbooks and journals, as the libraries there are rather poor and the internet extremely slow."

But there's another component to the program, and that's helping Ethiopia establish more sustainable food production. Grevers says deforestation, erosion and population density have wrecked havoc on Ethiopian land management. "Unfortunately, farmers are making some poor decisions by cutting down trees that would previously have protected the landscape, or by planting crops on steep terrains that then become subject to erosion."

Another issue is water management. "They have sufficient rainfall but mismanage it in such a way that it tends to cause more erosion and run directly into the Blue Nile. Saskatchewan has water shortages issues as well, so much of the expertise we have on conservation can be extended to Ethiopia."

Altogether, six U of S undergraduate and one graduate student have accompanied Mike Grevers to Africa, as well as seven faculty. Another four students will travel to Ethiopia with the project in early 2008."Above all, my goal is to widen the horizons of students from both countries," he says.

# THE NEXT DEGREE

A SIT-DOWN WITH DAN PENNOCK ABOUT A NEW UNDERGRADUATE OFFERING

The College of Agriculture and Bioresources will offer a new degree program in September 2008: the Renewable Resource Management Degree. *Agknowledge* spoke with AgBio Associate Dean (Academic) and Professor of Soil Science Dan Pennock, who was charged with leading the degree development process.

**Agknowledge (AK):** How long has this degree program been a gleam in the College's eye? Was developing it a difficult process?
**DAN PENNOCK (DP):** We began the process 18 months ago. It's not so much a difficult process as a lengthy and circuitous one: typically, it involves a large number of review levels through which you must pass, starting at the department level and moving up through the university's governing council.

Actually, there are very few new degree programs that are introduced at the university – no more than one every year or two. Right now, our College offers two degrees: the Bachelor of Science in Agriculture and the Bachelor of Science in Agribusiness.

**AK:** Are there studies you must do before you propose a new degree?
**DP:** You have to satisfy people that there's a demand for it, and to do that you can conduct an employer survey or talk to the graduates of your own College. In our case, we heard from both industry and our former students that there was a real need for renewable resource management expertise.

**AK:** Are there other degree programs like this one in Canada?
**DP:** Not in Western Canada – in fact, part of the paperwork for submitting a proposal for a new degree is to review other university programs to ensure it's not being offered somewhere else.

One of the more unique elements in this degree is our experiential teaching approach: for example, one component involves a field camp in September of the degree's third year. Another is a group project in the fourth year – a real-world work program with an organization like Parks Canada or First Nations people. This component will have the students develop a resource plan from start to finish.

I should add that we designed this degree in part to take advantage of the strengths of our existing faculty. We currently have an accomplished group of ten professors who offer coursework in environmental and renewable resources areas: some specialize in issues around the boreal region, others are extremely knowledgeable about resource economics and resource policy, etc. We'll hire one extra lecturer to complete our teaching contingent, and then we're ready to go.

**AK:** What sort of student would be best suited to take on this degree?
**DP:** He or she should be interested in the broader context of renewable resource management – it's an interdisciplinary field that incorporates plant ecology and the soil and resources sciences. The degree will not train students for a single skill but for a more holistic set of practical management proficiencies that can be taken directly into the field. I see our graduating students taking on roles like reclamation manager for oil and gas, oil sands or mining companies, or remediation specialist for forestry corporations that manage huge lease areas.

# 360º OF INFLUENCE

## AGBIO FACULTY MAKING PARTNERSHIPS THE WORLD OVER

Faculty of the College of Agriculture and Bioresources are a cosmopolitan bunch – not only do they travel the world in their research programs but the world beats a path to their door in Saskatchewan. The following stories should catch readers up on the innovative work of a few AgBio scholars.

College plant scientist Bob Bors is working with Japanese food chemist Mitsuko Ukai from the University of Hokkaido to identify the varieties with the highest health value to use in his breeding program of 'haskap' or as it's more commonly known, 'blue honeysuckle' (Lonicera caerulea). For the last three years, he or his students have helped Maxine Thompson evaluate the haskap breeding program at Oregon State University and have brought back many promising breeding lines. Takashi Suzuki of the University of Hokkaido has invited Bob to visit Hokkaido to collect more samples and to help evaluate their collection.

Bors and graduate student Jon Treloar are collecting plants of the deep-blue-coloured berry that grow wild in the boreal forests of the globe's northern regions including Canada. "It's blessed with an early fruiting season (mid June) and a flavour described as somewhere between a blueberry and a raspberry. The Japanese believe haskap has definite health benefits including high Vitamin C levels and more antioxidant properties than even blueberries," says Bors. His work these past years crossbreeding Japanese and Russian haskap varieties has produced "a nice soft long berry that can be used to make everything from wine to ice cream."

Next steps: Bors has planned a sabbatical next year to travel to every province in Canada to harvest samples of the wild plants and to track their whereabouts using GPS (Global Positioning System). "When this is done, we'll have the world's first global collection of this species."

Agriculture economics professor Bill Brown describes the business environment of Inner Mongolia, China as "a wide open economy with small businesses springing up on every street. In fact, when they build residential buildings, they design them so that in front of each apartment on the main floor, there's room for a shop." This fever of free enterprise has given his work teaching agriculture business venture management to Inner Mongolia graduate students in Hohhot, China some extra zip: "They presented business plans on everything from a corn-seed treating business to a cashmere factory. Some of these plans may make it into reality." The three-year teaching assignment is sponsored by the Inner Mongolian Agriculture University. In the meantime, Brown hopes to encourage his colleagues to share in the project. "Inner Mongolia is suffering with a huge population-related environmental crisis right now. Not once in the time I've been there have I seen water in a riverbed. I know our environmental scientists and economists would definitely be welcome."

A unique interdisciplinary collaboration between a U of S animal scientist and a California biochemistry researcher has resulted in the discovery that a gene that plays a role in immunity also controls coat colour in dogs. Using DNA from several hundred dogs, U of S College of Agriculture and Bioresources' Sheila Schmutz and Stanford University's Greg Barsh and their teams determined that a dominant mutation in the beta-Defensin 103 gene is the cause of black coat colour in the vast majority of dog breeds. "While our findings may have implications for human genetics down the road, the more immediate contribution will be for breeders who want to know whether their dogs will have litters of all-black puppies or if the litters will have pups that are both fawn and black or brindle and black," says Schmutz. With their findings on this research now published in the prestigious American journal *Science*, she notes her work will continue "on the dog side of the research – in showing what breeds it affects and designing the DNA tests to include this. And very soon, the DNA test that emanates from our work will be offered by HealthGene, a Toronto DNA diagnostic firm that markets its work to international dog breeders."

College animal and poultry science professor/researcher Phil Thacker has been traveling to China the past ten years to work with agriculture graduate students in Beijing's China Agriculture University. "Since the Ministry of Agriculture Feed Industry Centre project was established in 1997, I've gone back to Beijing 20-odd times to instruct students on the fine points of experimental design, data analysis and interpretation of international standards of research methodology," he notes. Another key piece of work for the U of S prof is finessing academic articles for these same students.

> ***...It might be worthwhile to use the synchrotron to analyze soil samples...***

"For a student to receive their MSC from this university, they must publish at least one paper in an established English journal while PhD students must publish at least two. Although most students have a working relationship with English, often their writing skills in the language are not up to our academic standards. That's where I come in."

Thacker's colleagues must be grateful for his help: in 2004, they awarded him one of the year's 50 Friendship Awards, the highest honour presented by the Chinese government to foreign experts. "We were each presented with gold medallions at a very special dinner ceremony in Beijing's Great Hall of the People," he recalls.

At least a third of the total organic nitrogen in soil is still unknown or at least poorly understood in terms of its molecular structure and ecological function. Soil Science Department Head Fran Walley and University of Rostock (Germany) colleague Peter Leinweber decided "over a cup of coffee a while back that it might be worthwhile to use the synchrotron on campus to analyze Saskatchewan soil samples," recalls Walley. (As *Agknowledge* readers probably know, the synchrotron is a football-field-sized super microscope that accelerates electrons to nearly the speed of light, producing intense light beams to probe matter with unprecedented precision.) "At first we weren't sure that we would be successful,'" she notes, "but we worked with the facility's scientists and have concluded that synchrotron techniques are complementary to existing methods of studying soil nitrogen and can help clarify the chemical structures of some of these compounds." Walley says that other soil science colleagues also are working at the facility and finding new applications for synchrotron techniques in soil and environmental science. "I can see the synchrotron building from my office window," she says, "and every day I sit here and wonder what else we could be doing there."

# AGKNOWLEDGE IS POWER

## EXERCISING THE GREAT POTENTIAL OF THE ILM INSTITUTE

Aboriginal people in Canada today face a variety of exciting but bewildering opportunities, one of them the challenge of managing their expanding land base.

The College of Agriculture and Bioresources has responded to that challenge – and to a request for research assistance from numerous Aboriginal groups and governments themselves – by launching the Indigenous Land Management Institute (ILMI). The Institute is a multi-disciplinary many-faceted initiative that will bring teaching, research, outreach and engagement together under one university-centred umbrella, says College Agribusiness professor and ILMI co-lead Tom Allen.

"The First Nation peoples of Saskatchewan began to contact us about land management after 1992, when they began to acquire significantly more land through their claims settlement," he recalls.

"Here at the university, we originally thought the best way to address that gap was to bring First Nations students into the AgBio college for diploma and degree programs, but then discovered that taking a strictly agricultural focus was too narrow an approach. When you're talking about land with Aboriginal people, you really must expand your scope and think in terms of everything from the land, sky and water to land resources and wildlife."

The newly designed ILMI is now in its first implementation phase. "We'll take three major approaches to create an information base on Indigenous land management," says Allen, noting the first is a research component that will incorporate themes of wealth creation, environmental sustainability, land governance and urban land management. The second is a knowledge exchange initiative including briefing papers, workshops and seminars, and the new International *Journal of Indigenous Resource Management.*

Third in this list is a series of educational programs, delivered through certificate, diploma, degree, graduate and fellowship programs in land and resource management. ILMI co-lead David Natcher was recently hired by the university.

"Right now, there is an urgent need among Aboriginal peoples to gain access to informed and timely information that can be used in management and decision-making," he notes.

"While there is a great deal of research being done on Aboriginal land management issues, all too often it is disseminated in outlets that are inaccessible to the very people who need this information most. One of our objectives with the Institute is to reverse this trend."

The new institute will be centred in the College of Agriculture and Bioresources, but will draw from a multidisciplinary base of University of Saskatchewan faculty with expertise in anthropology, agriculture, business and a variety of other disciplines.

"We're also very excited to have established working relationships with indigenous groups and affiliated universities in Australia, New Zealand, Alaska and Arizona. The goal here will be to initiate student and faculty exchanges, together with visiting fellowship programs, in order to exchange ideas and generate intellectual capacity at an international scale," says Natcher.

# EXTREME OUTREACH

## UNDERSTANDING THE CHALLENGES OF SOME OF PERU'S RURAL AREAS

Of academia's many disciplines, education may well be the most sustainable, for it is designed to train teachers who in turn train others to teach.

That wonderful quality of sustainability is personified in visiting scholar Delgermaa (Degi) Chuluunbaatar, a Mongolian crop science scholar completing her doctorate at the College and simultaneously sharing her expertise with impoverished farmers in rural Peru.

Her interest in Peru was first sparked when she spied an advertisement from the Institute of Inter-American Co-operation on Agriculture (IICA), and when she also received an expression of interest from University of Toribio Rodriguez de Mendoza of Amazonas (UNAT-A).

"It called for an intern to do a training needs assessment in rural Peruvian communities where poverty is high and agriculture the main economic activity," she says. "The university wanted to better understand the greatest needs of these people."

After she received an internship grant from IICA, Chuluunbaatar spent about a month in winter 2006 in four provinces of Amazonas, a region in northern Peru. The scope of the short project required her to develop the program, train its team members, visit other agricultural institutions, conduct research and workshops in rural Peruvian areas, then tie up the work in a summary report.

"We spent three days in each province, including organization of one-day participatory workshops in three provinces," she remembers. "Farmers came from all over the countryside for these sessions – anywhere from 11 to 39 people, many of whom had walked for hours to get there. I will never forget how women breastfed their babies and dogs ran around during each workshop."

Although issues varied from province to province, some were overwhelmingly typical: unemployment and poverty was one. "Most everyone is involved in family farming but product prices are low which means there is little return for the work.

"People usually own small plots of land outside town which are a three to four hour walk away. Because there are so few vehicles in this part of Peru, these farmers carry everything – corn, crops, grasses – on their backs. Some towns are accessible by horse, but most people do not own a horse.

"Then the infrastructure we take for granted does not exist in this part of Peru, so it makes communication between farmers difficult."

Her recommendations back to UNAT-A were comprehensive: "They should spend time within the communities to provide training and networking opportunities between farmers. For example, the university could have a small demonstration project in each community with a graduate student providing hands-on support.

"We also suggested that the university collaborate with other Peruvian government programs and its Ministry of Agriculture by sharing resources and technical staff. We hope they'll develop a core research team to keep up with this work, and that they'll include Canada in their future extension programs."

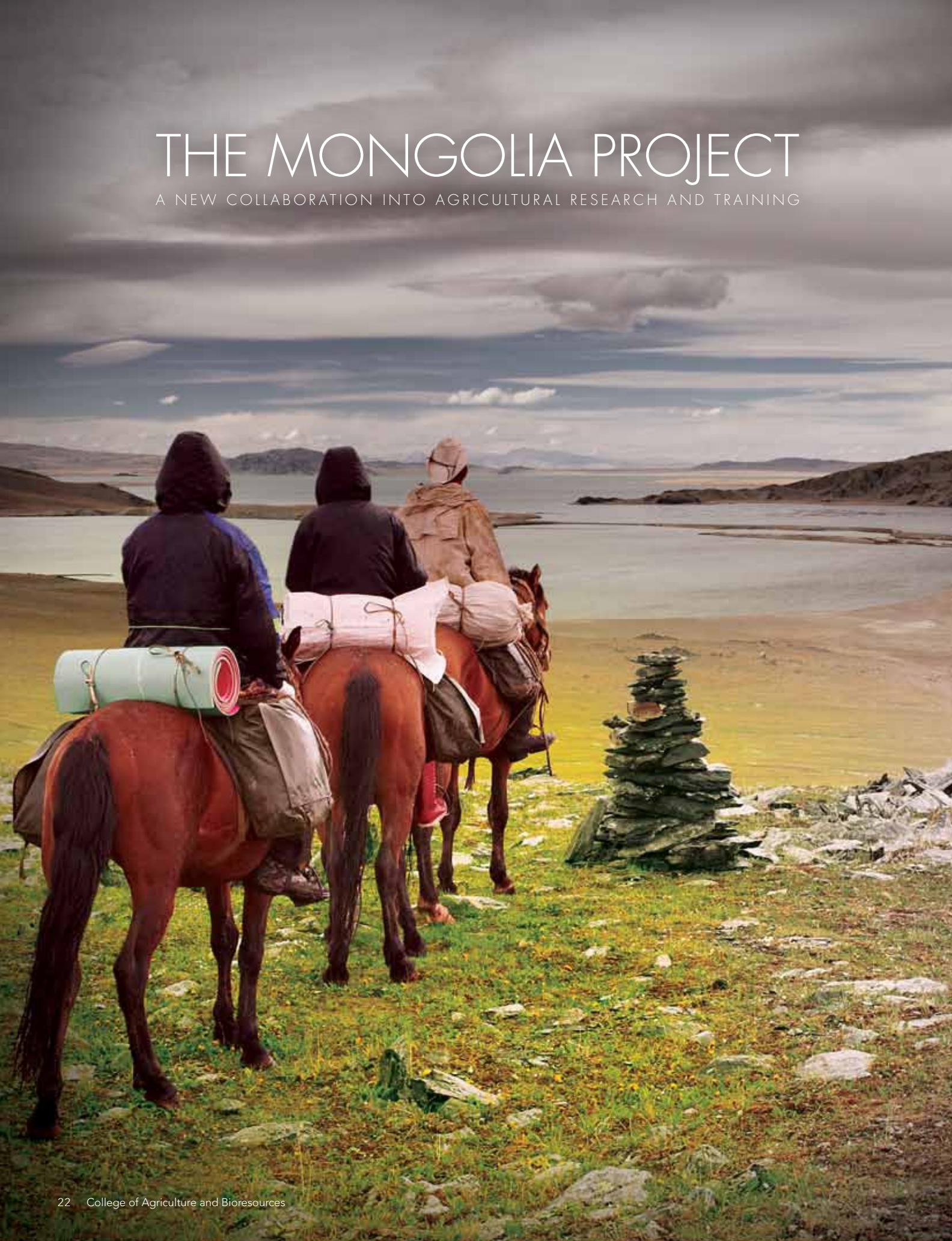
So would she return to Peru? "Definitely, but I'll need to finish my doctorate here first," says Chuluunbaatar.

"I believe there are now a number of opportunities available… My intention has always been to go home to Mongolia to help develop our agricultural industry.

"I also feel very much at home here in Saskatoon. The U of S is a great environment in which to grow, learn and develop. I feel well blessed by my research team, I couldn't ask for more."

# THE MONGOLIA PROJECT

## A NEW COLLABORATION INTO AGRICULTURAL RESEARCH AND TRAINING



Observers who know the two regions well say Saskatchewan and Mongolia have many physical attributes in common – including a cold-climate semi-arid agriculture that contains a great deal of livestock and grasslands, and a small human population dispersed over a vast territory.

It's small wonder then that two regions and a few of its research institutes have collaborated on so many projects together over the past few years, says the College's Paul Stevens.

"In early 2002, the U of S signed an agreement with the Mongolian State University of Agriculture (MSUA), paving the way for faculty visits, student exchanges, and collaboration in agricultural research and training," recalls Dr. Stevens. "That agreement also brought Degi Chuluunbaatar to the AgBio College as a visiting scholar a little later that year (see another story about Degi and her work in Peru in this issue of *Agknowledge*).

"At about the same time, our College joined forces with AgriTeam Canada in a Canadian International Development Agency (CIDA) funded project to develop minimum tillage techniques in Mongolia."

In 2004, that project blossomed into the Mongolia Training for Rural Development Project, a seven-year $2.8-million project sponsored again by CIDA. A partnership between the U of S, the Mongolian State University of Agriculture, the National Agriculture Extension Center of the Ministry of Food & Agriculture, and AgriTeam Canada, the project aims to reduce poverty and develop infrastructure in rural Mongolia.

"We've initiated 70-odd separate initiatives under the Mongolia project," notes Stevens. "Some of our ongoing projects include training of local researchers, in which we help these folks develop good research practices; others involve building knowledge-transfer systems with computers and projectors, so they can retain and share what they've learned with others in the region.

"We've also taken to Mongolia cultivars of Saskatoon berries, cherries and blue honeysuckle. One of our Masters students is working on a project with those plant resources right now."

Debra Rasmussen is an agricultural economist with AgriTeam Canada; she's the Community Development and Results Based Management Specialist for the rural Mongolia project. She notes the rural training project is also sponsored by Centerra Gold Inc., a company partly owned by Saskatchewan's Cameco Corporation.

"One of the big trends in extension projects all over the world is their shift away from government funding to more corporate support," she notes. "Centerra is now helping out with investment capital that it's sinking into rural communities. This money is in chronic shortage for rural Mongolia, mostly because agriculture there is considered a high-risk business."

Rasmussen says the upshot has been a three-year subprogram to introduce impoverished people – mostly women heading single-income family households – to vegetable production. "The first year of the program sees these people learning basic skills to produce vegetables for their household food security, the second year moves them into managing surplus crops for sale so by the third year, they're ready to graduate."

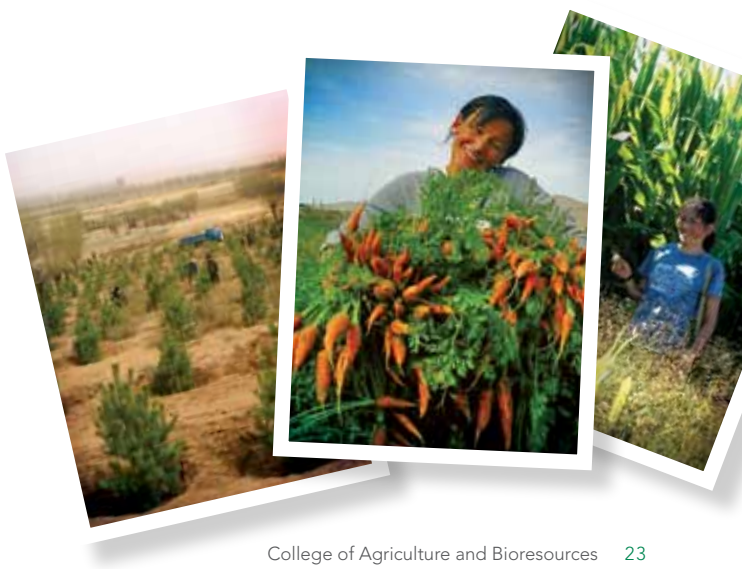
The human development involved in the three-year program "is so important," she insists. "You can't put farming equipment into regions like the ones we see in Mongolia, that just wouldn't play.

"The most important change we can effect is an attitudinal change for these impoverished people – you see them learning basic skills of agriculture, but then you see them also learning to work in groups to train and to work in the fields. They problem-solve, they learn to manage their time and work in necessities like fence-fixing, irrigation, etc.

"I often think of one lady who's gone through the program: when she began, she had two children and was pregnant with her third. She worked so hard that first year, learning to grow carrots – and today she has yields that are well about the national average," she says.

"She and a few other growers take their surplus goods into a neighbouring town where they've learned they can get a better profit, and she's talking about commercially preserving her products so she can sell something other than raw carrots," adds Stevens.

"And she even took home $1,500 last year from her produce. That may not sound like much to us, but it's a whole new world of financial control."



# CULTIVATING INTEREST

## A NEW APPROACH TO THE 8TH INTERNATIONAL PLANT COLD HARDINESS SEMINAR

Delegates to the 8th International Plant Cold Hardiness Seminar this August in Saskatchewan may well have gone home feeling they just experienced an invigorating holiday – not an intensive week of scientific discussion on plant life in cold climates.

"We really wanted to ensure this year's symposium was balanced and relaxed. It's our belief that in a comfortable atmosphere, academics can more readily exchange ideas and discuss their research interests," explains Conference Co-Chair Karen Tanino, also Associate Professor of Plant Science with the College of Agriculture and Bioresources.

"To that end, we split the conference up into two components: the first half we spent here on the U of S campus, then we bussed everyone up to Elk Ridge just north of Waskesiu. When lectures and presentations were done for the day, we had golf tournaments, boating and kayaking tours, and Aboriginal dance presentations.

"There were times I felt more like an event planner than a conference co-chair, but I believe attendees got a lot out of their week."

Tanino and Conference Co-chair Larry Gusta explain this prestigious conference attracts representatives from countries around the world, including Australia, Belgium, Chile, China, The Czech Republic, Denmark, Japan, United Kingdom, U.S. and Russia. Held every three years, the August 3-9, 2007 conference represented the first time the event has ever been held in Canada.

"Our conference's theme was Plant Cold Hardiness: From the Laboratory to the Field," Gusta notes. "Topics for the seminar included discussions on the impact of global climate change on plants, the freezing process and patterns of freezing on tender to very hardy plants, genetic bases of superior cold tolerance, understanding overwintering and injury in plants, to name a few."

A bonus for graduate students attending the seminar was a seven-day pre-conference course on low temperature abiotic stress; eleven students from Japan, France, Chile, Australia, Austria, Canada and Norway attended.

"This special course also allowed us to invite our keynote speakers to come to Saskatchewan a week ahead of schedule to present lectures in their areas of expertise and conduct hands-on labs for the grad students," says Tanino. "It was quite neat to see young people from all over the world come together with these renowned scholars and exchange ideas on their research."

She notes that in a world dealing with climate change, more research is needed on plant abiotic stress, "but there are few places students can take graduate level courses on the topic. In addition to our current on-campus course, I'm planning to develop a distance-education model of the August course so students around the world can continue to be trained in abiotic stress subjects of drought, salt, heat and cold."

All in all, Gusta believes the 105 registrants enjoyed the conference enormously. "At Waskesiu, a group of us would go outside late in the evening into the early morning hours, to see if we could spot the aurora borealis. While we were waiting, songs would break out or someone would play a flute… At times when it was quiet, you could hear wolves howling in the background.

"I knew the whole thing was a success when a few of our keynote speakers wrote to tell us said it was the best conference they'd ever attended."

# ADDING TO THE MIX

## PLANS FOR NEW FACILITIES AROUND CAMPUS

Groundbreaking should begin next spring for two new buildings on the University of Saskatchewan campus – all driven by innovative College of Agriculture and Bioresources research programs.

The first of these is the Feed Technology Research Facility. This $12.6-million pilot plant will be designed to focus on feed processing technology and animal nutrition, says Professor Henry Classen, head of the College's Department of Animal and Poultry Science. "The facility is one of just a handful of its kind in the world," he notes.

"And because it's so unique, we expect it to attract international attention and collaboration."

While the Canadian Foundation for Innovation and the Saskatchewan government have devoted a combined $10 million to the facility, fundraising for the remaining $2.6 million continues. "We wish to extend special thanks to the College of Agriculture Degree class of 1966 for their generous support of this project," says Classen.

Designs for the new facility see it as a 1,500-square-metre multi-level structure with a materials storage area, plant office, a grain storage facility, research stations, space for processing research and a main pilot plant. Construction of the building in the Farmstead North Precinct at Preston Avenue and 108 Street should begin in spring 2008 and be completed by fall.

Although the research program for the new facility is diverse, one major focus will be the multi-layering of different materials – including vaccines, nutraceuticals and live organisms like probiotics – onto feeds. "Providing dairy cows with feed coated with, for example, fish oil provides a number of benefits," says Classen. "Not only do you add omega-3 fatty acids to the animals' diet, but you transfer that health benefit to the people consuming those dairy products."

Other research goals for the facility include creating high-value plant-based feed products for the global aquaculture sector, feed processing and engineering for energy efficiency and biosecurity, plant breeding specifically for feed processing and animal nutrition traits, as well as applying synchrotron science (at the University of Saskatchewan-based Canadian Light Source facilities) to study feed structure.

The second project on campus is the planned Grains Innovation Laboratory, led by Dorothy Murrell. "Although we're still in the planning stages of this new facility, we've now received $5 million from the federal and provincial governments to build an 800-square-metre lab adjacent or adjoined to our existing Crop Science Field Laboratory," notes Murrell, who was hired in January 2007 as the managing director of the Crop Development Centre.

"The proposed building will allow us to expand out of a very cramped 400 square metres of lab space in the AgBio building, and should give us new opportunities to investigate nutraceuticals, sustainability and environmental issues in grains research as well as our usual programs.

"For example, we're currently looking into a new barley variety that should reduce the amount of free phosphorous coming out of the swine industry. We're also considering how our durum varieties can produce new types of pastas for the food industry."

The new lab will combine wet chemistry, baking, malting, pulse cooking, grain drying equipment – "all types of different trials necessary for our research," says Murrell. "We've already done an astounding amount of planning for this lab, including plotting out the air flow, wiring, gas, water, chemical storage and refrigeration functions.

"Once it's complete, we'll have a sophisticated and fully equipped facility that will allow faculty and graduate students to further pursue our research mandate."

# KIS AND TELL

## KNOWLEDGE TRANSFER ENLIGHTENS BOTH ACADEMIA AND COMMUNITY

A new blog discussing the future of agriculture in Saskatchewan has recently made its appearance on www.illativeblog.ca, thanks to the work of the U of S's Knowledge Impact in Society (KIS) group.

Launched in November, The Illative Blog features a weekly short essay speculating on a facet of agriculture's future and inviting readers from every walk of life to respond. For example, the site's first essay by U of S Bioresource Policy, Business and Economics Professor Richard Gray asks a series of questions on the future of agricultural research in Canada, including:

"If R&D expenditures have fallen because of a perceived gloomy future for agriculture, will high-income growth, increased biofuel production and growing environmental concerns stimulate the demand for the creation and adoption of new technologies?" and "Will a lack of access to technology and a lack of freedom to operate continue to slow the rate of innovation, or can the institutions that govern agricultural research be modified as part of the national innovation strategy?"

One of 11 such projects across Canada, the KIS initiative aims to improve the flow of information between Saskatchewan's agricultural sector, rural communities, governments and academia, says Agriculture and Bioresources Professor Murray Fulton, who leads the Saskatchewan KIS project. He notes the three-year $600,000 initiative is funded by the federal Social Sciences and Humanities Research Council's (SSHRC) knowledge transfer program and the University of Saskatchewan.

"SSHRC usually funds conventional research in the social sciences field, but this project is a bit of a departure for them. Their focus in this case is to look at how we get research from the university out into the community, and from there how we get the community to feed back to the university.

"In the old days, they would have called this 'extension' but today we call it knowledge transfer."

The blog was preceded by another knowledge transfer program in April 2007: Ag 2020: What's Your Vision? asked participants to imagine themselves in the year 2020 and to speculate on what the industry might be like at that time (the resulting twelve essays from Saskatchewan academics and industry researchers are posted on the www.kis.usask.ca site.)

"And in early June 2007, we held a conference entitled Food & Fuel: The Implications for Agricultural Research Policy," adds Fulton. "We used the hot topic of ethanol to lead into a more general discussion of agricultural research policy, which truly is the underpinning of the industry."

Future projects for the KIS initiative include another conference in late 2008 to debate the rise and fall of agricultural co-operatives in Canada and the United States. "It's an interesting topic for discussion because co-ops were once such a large part of the landscape of agriculture in the two countries – then, within a few years, they literally disappeared in both regions," notes Fulton.

And for those purely curious as to the origin of the KIS blog's name – what the heck does 'illative' mean, anyway? – Fulton says that it has to do with making inference. "Inference is interesting because it is one of the few ways that we can "see" into the future," he notes. To see how inference fits with a ladder, he suggests people visit the site at www.illativeblog.ca.

"The more discussion and debate we can generate, the more we can envision and prepare for the future of agricultural research in this country."

# THE AIR OUT THERE

FORMER DEAN JOHN STEWART DISCUSSES THE BENEFITS OF STUDYING ABROAD

Two projects – one focused on a stretch of native Saskatchewan grassland and the other examining soil nutrients in a rice-producing area in the Philippines – made a world of difference in John Stewart's professional life.

And because these projects opened his eyes to the value of travel for young academics, this former Dean of Agriculture (1989 to 1999) and influential soil scientist has created a scholarship to encourage students to spend "at least a short period of study time abroad.

"My hope is that the scholars who receive it take the opportunity to work in a different culture and then come back, enriched, to their own."

Born in Northern Ireland in 1936, Dean Stewart received his BSc, BAgr, and PhD at Queen's University, Belfast, and was later awarded a DSc from that university in 1988. While in Belfast, he wrote to Don Rennie (then Soil Science department head and later Dean of Agriculture at U of S) "to find out if the university had any interest in my research (in the chemistry of phosphorus in soil) and by extension, in me, assuming I could pick up a National Research Council (NRC) postdoc scholarship.

"He told me to forget NRC and come to Canada immediately."

When Stewart arrived in Saskatoon in 1964 on a year 's leave from his job in Belfast, he walked into "a really exciting community of scientists. Besides the usual teaching and research roles, the College of Agriculture had the mandate of being a research arm of the government, so it had strong connections there as well as with the province's farmers."

He also found the college involved in early work on carbon sinks and global warming. "Researchers here were looking at organic matter in soil, specifically at a technique that used isotopes to detect how long carbon stays in organic matter. This was a radical departure from previous thinking, which considered soil carbon to be static in nature."

Launched in 1967, the 'Matador Project' was one of first Canadian initiatives in which Stewart was involved. "We looked at the lifecycle of a stretch of prairie grassland that had never been cultivated. It changed our focus from looking at land as an element in the production of food to considering it in its environmental integrity. It was an early bridge from agriculture to ecology."

The Philippines project, part of what is now referred to as the Green Revolution (1971), involved the introduction of new varieties of rice that matured in 90 days. "This meant the farmers could grow three crops of rice where previously they'd only grown one.

"It also meant there was a greater demand on that soil to provide nutrients, one of them zinc. Because I'd done some work on zinc, a United Nations agency tracked me down to work on the issue."

During his time there, he learned a great deal about tropical agriculture "and was amazed how much it reflected back on my work in Saskatchewan. At times, I suspect the Philippines project got less from me than I got from it. I may have contributed my knowledge on the chemistry side, but what I got was a whole new understanding of supply and demand, and the challenges facing tropical agriculture.

"For someone who traditionally spent his time in a laboratory, worrying about what happens on the end of a pin, it was just a tremendous experience."

# TAKING OUR PULSE

## MORE RESILIANT STRAINS CONTINUE TO BRING GROWERS HEALTHY MARGINS

Saskatchewan researchers and growers have been quietly experimenting with pulse crops since the mid 1970s, when a wheat glut forced Canadian farmers to seriously consider their options.

Since then, pulses (also known as the legume group comprising peas, beans, lentils, chickpeas and fababeans) have taken a significant role in Saskatchewan's agriculture industry. According to the Saskatchewan Pulse Growers, the province today produces 99 per cent of the Canadian lentil crop, 75 per cent of its peas and 85 per cent of its chickpeas. In all, about 12 per cent of the province's land base is devoted each year to pulse crops.

"On the international trade side, Saskatchewan exports over 90 per cent of its pulse products," says AgBio Plant Sciences Professor and pulse breeder Bert Vandenberg.

"Much of that crop goes straight to southeast Asia, which is an expanding market of 1.5 billion people. As we continue to refine the different varieties of lentils and chickpeas we produce for this sector, we fully expect demand for Saskatchewan pulses to grow."

Vandenberg says the industry has come a long way since the first varieties of pulse were planted in Saskatchewan 30 years ago. "Unfortunately, because we borrowed both our varieties and our technology from other regions, those first experimental years didn't work too well for us: I remember some of the early lentil crops flattening to the ground as we tried to harvest them.

"But as hardier varieties have been bred for our climate, this province has been quite successful in exporting superior products."

And of course, the University of Saskatchewan has been instrumental in that success. AgBio Plant Science Professor and pulse researcher Rick Holm recalls that when the Crop Development Centre was formed in 1971, it was led by a single research scientist: U of S Professor (now Professor Emeritus) Al Slinkard along with a small troupe of graduate students.

"Part of the CDC's mandate was to introduce new crops to the province. When I think back to the work accomplished under his leadership, I'm always amazed," says Holm.

"Dr. Slinkard and his team introduced 19 different pulse varieties to the industry, including Laird, the most widely recognized lentil variety in the world."

And given the fact that developing any new plant variety can take anywhere from eight to ten years, "with at least two years of field grow-out trials and a great deal of lab work on quality and safety of the product, one can only imagine the focused work put into those first years of research."

Today, pulse research is high-profile business at U of S. In early 2006, the CDC and the Saskatchewan Pulse Growers announced a $21-million, 15-year pulse breeding collaboration, to be conducted at the recently launched $3-million pulse research lab on the U of S campus. A refreshed consort of researchers complements this robust infrastructure – AgBio Professors Bunyamin Tar'an and Sabine Banniza among them.

For his part, Dr. Tar'an has been working to map the genetics of ascochyta blight in chickpeas. The disease is well known to growers in North America: a particularly bad case in the Pacific Northwest caused almost complete crop failure in the '80s, and the blight has cut a swath through Saskatchewan acreages in recent years.

"Given that chickpea has just recently been introduced to Western Canada and that it is highly susceptive to disease in this region, we've been challenged to develop a more robust variety of the crop," he says.

"But since the early 2000s, we've seen our Saskatchewan growers become more experienced with chickpeas, and there's been better technology introduced to the industry. Plus we've been successful in understanding the genetics of the disease – we know for example that there are some common and specific genes that can be combined to our advantage."

Professor Banniza has focused much of her research on the ubiquitous ascochyta, but is also concentrating on stemphylium blight of lentils. "This is a disease we have seen at low levels for a long time, but seem to be seeing more of in recent years," she says. "It could be that the disease has been misdiagnosed until now because to the untrained eye, its symptoms are very much like those of ascochyta."

She's also conducting what she calls "basic research at the microscopic level" to examine how the pernicious colletotrichum truncatum, a fungus that causes anthracnose, interacts with its host lentil plant. "Bert Vandenberg is doing a complementary study to determine what genes on the plant side are involved. Eventually, we hope to better predict the durability of resistance we've already bred into lentil cultivars."

But whichever way a researcher's focus tends to lead her or him, the work done by these crop experts is always collaborative. "Although each of us has a specific set of diseases we study and screen, ours is very much a team approach – everything I do feeds into our larger research agenda," notes Banniza.

Bunyamin Tar'an credits the Western Canadian pulse industry with a similarly supportive role: "Both the Saskatchewan and Alberta pulse growers associations have contributed enormously to our success here – not just with funding but with their enthusiasm," he notes.

"It's great to work directly with the growers because you can see the results of your work right there in the field."

# PARTNERSHIPS

## HIGHLIGHTING DONORS OF THE COLLEGE

The College of Agriculture and Bioresources values its many partnerships with individuals, alumni, supporters, industry and government. While we salute all our many collaborators, we pay special tribute to the organizations featured here.

**CropLife Canada** is a trade association representing the manufacturers, developers and distributors of plant science innovations used in agriculture, urban and public health settings across Canada. Recently, the College entered a partnership with CropLife Canada to begin a lecture series that will encourage people to consider the dynamic role agriculture plays in their communities, ecosystems and the world. "We believe it's important to promote the development of a broad understanding of the challenges and opportunities within the agricultural sector," says Lorne Hepworth, President, CropLife Canada. Watch for details of this lecture series in Spring 2008 on the college website.

To celebrate the 10-year anniversary of InVigor canola, **Bayer CropScience** offers 10 scholarships of $1,000 each for the next three years, recognizing academic achievement of second and third year undergraduate students from the College of Agriculture and Bioresources. Winners of the 2007 scholarships were announced in last October and winning essays published in the November Western Producer. "As a world leader in innovation, Bayer CropScience is committed to helping young agricultural students further their post secondary education. The next generation of graduates from Canadian university agricultural programs will enter the work force at a very exciting time for this industry," says Lionel Lamont, Marketing Manager, InVigor, Bayer CropScience.

A 130-year-old family owned and operated business in the U.K., Warburton's goal is to ensure that its values are relevant for people in the 21st century. Understanding customers' desire for quality products, the company has invested in Canadian products, research and people. "For us, this isn't just a business, it's a way of life," says **Warburton Foods Ltd. Canada** Director Bob Beard. The College of Agriculture and Bioresources now offers a Warburton's undergraduate scholarship and is working on research collaboration with the company. There are many such opportunities for students who wish to study or eventually work overseas with industry partners.

The mission of the **Saskatchewan Chicken Industry Development Fund** is to provide funds for research, market development and promotional activities for the Saskatchewan industry. To support students pursuing careers in this area, the SCIDF created two annual awards for individuals pursuing either a degree or a diploma at the College of Agriculture and Bioresources. "Our informed youth are key to the success of this industry in Saskatchewan", says Cliff Welfing, SCIDF Chairperson. In 2006, there were ninety-three chicken farmers across Saskatchewan and three processing plants. The production sector employs approximately 30,500 people in Canada and supports thousands of other jobs that depend on the industry. Quota auctions and check-offs on chicken grown as a result of these auctions are the sole source of funds for SCIDF.

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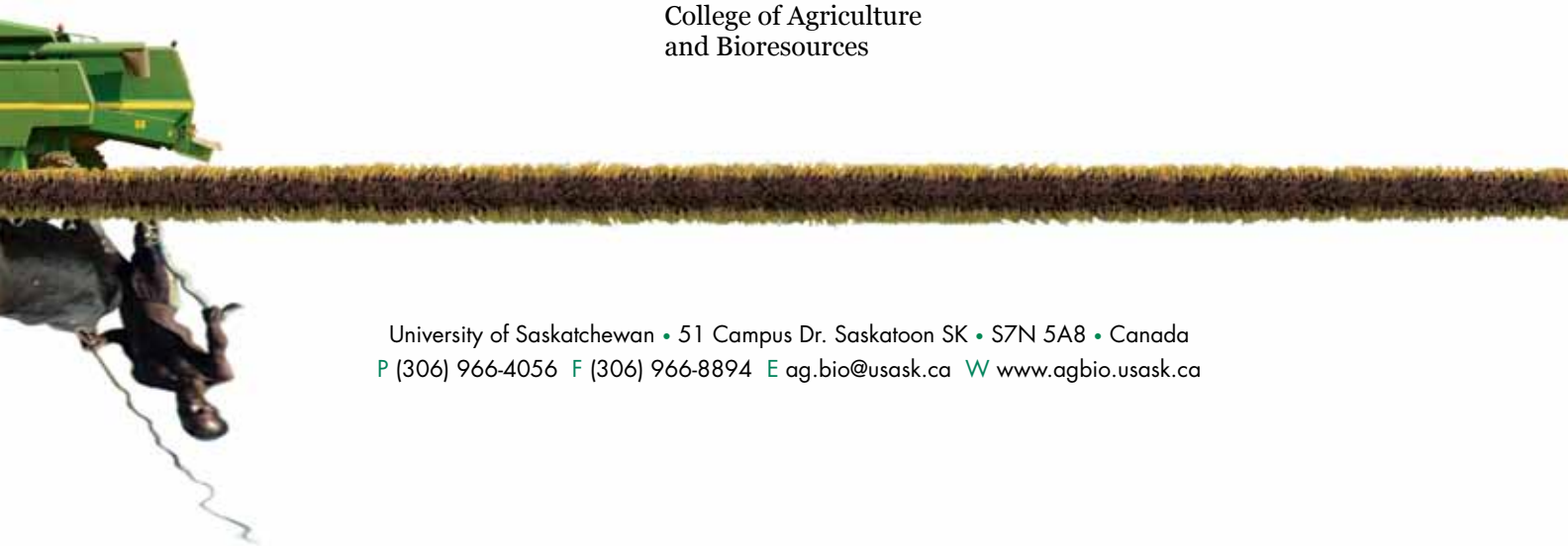

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