Ag-West Bio Annual Report 2014-15

IMAGING OUR WORLD. IMAGINING THE POSSIBILITIES

Ag-West Bio

President's Message

> AWB continues to partner with funding organizations to **bring new programs to the community**

During the last few months a number of important and exciting initiatives have been launched in our community.

The Global Institute for Food Security (GIFS) has established new, significant initiatives including programs in seed technology, rhizosphere biology and digital agriculture. The Canadian Light Source (CLS), currently celebrating its 10th year in operation, is developing an R&D program on agricultural applications of synchrotron technologies. The newly constructed cyclotron offers additional, important technologies for a better understanding of crop plant biology. Saskatchewan continues to be a leading centre for agricultural genomics, with major funding from Genome Canada recently awarded to local researchers engaged in projects relating to improvement of cattle, pigs, wheat and lentils. The Saskatchewan Food Industry Development Centre has received funding to expand its important work in food product development. These examples of the growth in our community, along with other cluster activities, will certainly contribute to the growing recognition of Saskatchewan as an international centre for agricultural bioscience.

Over the last 12 months, our staff has worked energetically with our partners in the successful organization of significant conferences, workshops and seminars, including two international conferences: The Agricultural Bioscience International Conference (ABIC) in October 2014, and the 14th International Rapeseed Congress in July 2015. We will continue to promote the national and international recognition of Saskatchewan through the support of events such as the 34th Manning Innovation Awards, which will be held for the first time in Saskatchewan in the fall of 2015.

Ag-West Bio continues to partner with funding organizations to bring new programs to the community. These include Western Economic Diversification, for pan-prairie network development; the National Research Council Canada – Industrial Research Assistance Program (NRC-IRAP), for competitive intelligence services; and the Agriculture Council of Saskatchewan, for a consumers' survey on food preferences.

I would like to acknowledge the strategic guidance provided by our volunteer board. The input from our directors continues to be critical to our long term operational plans. I also wish to thank the staff for their tireless effort and outstanding commitment in striving to achieve our strategic goals. Finally, we gratefully acknowledge the continued financial support provided by the Saskatchewan Ministry of Agriculture and the Agriculture and Agri-Food Canada Growing Forward 2 program. ■

Wilf Keller

Letter from the Chair

> Ag-West Bio has **taken the lead over the past year** in presenting industry to government and the university

Ag-West Bio entered its 26th year of operations with renewed enthusiasm about its capacity and potential to influence Saskatchewan's bioscience economy, and to contribute to a more profitable and sustainable bio-based global economy.

The global bioscience system is poised to transform the global production system and disrupt many of the product and service markets Saskatchewan producers depend upon. Applying information and communications technologies to discovery science, plant breeding, production and market segmentation holds great potential to significantly accelerate the pace of discovery and innovation. Ag-West Bio has been working to position Saskatchewan as a leader and partner in these transformations.

In addition to our successful Commercialization Fund, which has invested in more than 50 companies and has a current portfolio of 14 entrepreneurial bioscience firms, Ag-West Bio has taken the lead over the past year in presenting industry to government and the university, helping to facilitate the development of new scientific and technical capacity in Saskatoon and Western Canada. This includes the continued development of the Global Institute for Food Security, a $52 million public-private-university partnership at the University of Saskatchewan.

Equally important, Ag-West Bio has worked hard to bring the world to Saskatoon by hosting major events: The Agricultural Bioscience International Conference brought 370 speakers, investors and policy makers to Saskatoon in October 2014; and the 14th International Rapeseed Congress engaged 850 international delegates in July 2015.

On behalf of the Ag-West Bio Board of Directors, I would like to thank the Saskatchewan Ministry of Agriculture for its on-going and sustaining support, and Agriculture and Agri-Food Canada for support through Growing Forward 2. A big thank you also goes to Ag-West Bio staff for their hard work and professionalism, and to our members and other stakeholders for helping to build this community through partnerships and participation. We look forward to a growing and prosperous new year. ■

Peter W.B. Phillips

Vision: Saskatchewan's catalyst for leading Canada's foremost bioeconomy.

Mission: Accelerating innovation - enabling companies to commercialize research.

Mandate: To provide leadership, as a catalyst, to link existing capabilities and resources in order to strengthen the bioeconomy industry in Saskatchewan.

Ag-West Bio Board of Directors

Peter Phillips (Chair) – U of S Johnson Shoyama Graduate School of Public Policy

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Maurice Delage – Delage Farms

Laurie Dmytryshn – PIC Investment Group Inc.

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Brent Zettl – Prairie Plant Systems Inc.

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Brad Bly – Director of Commercialization

Mike Cey – Director of Corporate Initiatives

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The New Green Revolution:

High-throughput plant imaging

Over the next 50 years, farmers will need to grow more food than has cumulatively been grown since mankind emerged.

While the first Green Revolution radically boosted crop production, we're in need of another big boost. A technology with significant promise to help with that boost may surprise you: imaging.

Research in genomics over the past 20 years has provided the foundation for the next big technological advancement. Ag-West Bio President and CEO Wilf Keller explains, "We now have the basic genetic blueprints of many plants, thanks to genomics research. But genetics are only part of understanding what happens in plants. Phenotypes—how plants express genes as height, maturity time, resistance to disease, and number of seeds, for example—is just as important."

Until now, imaging tools have been used primarily for human health applications. With Saskatchewan's proximity to the agricultural sector, the research cluster here has turned its attention to potential applications for animals and plants.

Plant breeding has been an analog activity since the beginning of agricultural practice. Maurice Moloney, executive director and CEO of the Global Institute for Food Security (GIFS) says, "If we can digitize images of plants and crops, instead of humans having to do the analysis visually, we would have a trait-based database that could interface with these powerful genome sequencing tools that are already in place."

> "There is untold potential in unexplored areas of research, **such as the study of plant roots**"

"People often don't fully appreciate how the combination of high-performance computing and agriculture will change how we do things. The farmer's field will become more and more electronic in many ways. It already is, with GPS, but to get the full value of this interface we shall need to use imaging technology. Eventually, we should get to the point where we can look at a genome and predict how the plant will grow."

An impressive selection of tools

Saskatoon's world class agricultural research infrastructure is well known. The potential to apply these tools toward plant imaging is just beginning to be explored.

The Canadian Light Source (CLS) synchrotron is at the core of this infrastructure. It is making the most of its position next to an agricultural research university by highlighting opportunities for agricultural research in all three of its research theme areas.

Robert Lamb, executive director of the CLS says, "We have developed these imaging tools in these amazing facilities. They didn't develop the technology for plants originally, but now we can

continued on page 6

Top: Robert Lamb, Executive Director, Canadian Light Source

Bottom: Neil Alexander, Executive Director, Sylvia Fedoruk Canadian Centre for Nuclear Innovation

Right: The Far Infrared Beamline (Far-IR) at the Canadian Light Source synchrotron.

Top: Saskatoon's research cluster includes VIDO-InterVac, a vaccine R&D organization with a level 3 containment facility, located on the U of S campus.

Bottom: Drones, or unmanned aerial vehicles (UAV) are finding a place in agriculture. The UAV research program at the U of S is just getting off the ground.

apply all these tools to the plant world. You can see more than the shape of a plant; you can see it alive, *in situ*. You can see chemical interactions in real time."

At the Sylvia Fedoruk Canadian Centre for Nuclear Innovation, Executive Director Neil Alexander says the new cyclotron is open for business. The cyclotron produces radio isotopes, and many of the most commonly used elements in plants, such as carbon, nitrogen and oxygen are easy isotopes to make and use.

"We basically attach a little light to an atom, and that light flashes once. When it flashes we can see where it is and how it is being used," says Alexander.

There is untold potential in relatively unexplored areas of research, such as the study of plant roots. Buried in soil, roots and their behavior have not been studied *in situ*. "We can light those roots up," says Alexander, "and we can watch real time processes like water movement and nitrogen fixation."

While many researchers are focused on imaging of individual plants, others are turning to the fields to explore opportunities for plant imaging. The land surrounding the University of Saskatchewan (U of S) and Innovation Place is another priceless piece of infrastructure.

Steve Shirtliffe, a professor in Plant Sciences at the U of S, is working closely with a local unmanned aerial vehicle (UAV) production company, as well as data processing companies, to build capacity for imaging from UAVs from the ground up.

He says, "The UAV imaging industry has a problem with being able to cross reference their images with ground truthing. At the U of S, we have tens of thousands of acres of ground-truthed fields, and now we can compare that to what we can see from the air."

Studying crops in their true environment ensures the most accurate measurements. Field-scale research is another aspect in the trend towards phenotyping. The UAV research program at the U of S is just getting off the ground.

"We want to see what we can see," says Shirtliffe. "Are fertility requirements being met? Can we determine input optimization in crops? Are producers getting optimum plant populations? And how does that affect their yield?"

A golden opportunity

In July, Saskatchewan's existing research infrastructure received an unprecedented boost when the Canada First Research Excellence Fund awarded the University of Saskatchewan $37.2 million over seven years—the single largest federal grant ever received by the university—to establish a Phenotyping and Imaging Research Centre.

The research will involve multidisciplinary teams across the U of S campus and around the world, under the leadership and management of GIFS.

"The success of the project really relies on a multi-disciplinary approach," says Maurice Moloney. "We will have a team that comprises computer scientists, mathematicians, physicists, engineers, and plant biologists. You'd think you'd mainly be studying plants, but really the focus is on number crunching. There's already a lot of talent here in our community, but these opportunities will be a magnet for more talent."

Paul Babyn, head of the Department of Medical Imaging at the U of S, agrees: "We've gone from concept to reality, getting the infrastructure and the people on the ground who know what to do with it. We also have more people coming, now that the cyclotron is up and running, including a nuclear physicist who will be working on plant imaging and detection."

Wilf Keller adds, "It's a strong example of what you can accomplish when you pull together a truly multi-disciplinary team to work together to understand plants and plant processes."

The U of S team and other research teams around the world are all trying to solve the issue of a phenotyping bottleneck in the research process. Researchers are producing data faster than they can process it, and they often lack computing tools designed to analyze data quickly and efficiently into a usable format.

The funding will help to build a research platform that takes a systematic look at digitizing plant images and making them searchable. The project will begin by creating a methodology and data standards for storing mathematical descriptions of phenotypes that can then be cross-referenced with genetic databases and tested to determine whether predictions of plant performance can be made.

Further research will be undertaken to explore what kinds of information can be gathered with all the imaging tools at our disposal, as well as developing some portable options that can bring imaging equipment right into the fields.

A global challenge

Creating databases of plant phenotype information in line with genome databases is a monumental task. Other countries, including Australia and Germany, have research institutes already devoted to the effort.

International cooperation is key to evolving the knowledge of plants far enough and fast enough to respond to our global food requirements. "This challenge requires international collaboration," says Moloney. "Within a few years, we will be able to make the information that we uncover available to anyone in the world. Other groups may be able to contribute to the knowledge base as well. That means that developing countries will have better tools for plant breeding."

From the cellular and molecular level to the analysis of fields and the growing environment, phenotyping and analysis through high-throughput imaging will provide a depth of knowledge we could once only imagine.

Keller sums it up: "Imaging is another technological layer that we are superimposing over all the other tools we have. Although you can never get rid of all the guesswork in scientific inquiry, this will give us a more scientific basis for our decisions." ■

The Saskatchewan Structural Sciences Centre at the University of Saskatchewan.

COMMERCIALIZATION: **SASKATCHEWAN BIOSCIENCES**

Challenging the status quo

> “The concern is that **humans, not just polar bears, will be unable to adapt to climate change by 2050**”

By Brad Bly, Director of Commercialization

At BIO World Congress on Industrial Biotechnology and at the Advanced Biofuels Symposium in 2015, an overt theme was the findings of the Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC), which was finalized in 2014.

The information presented in the report is staggering. It outlines the distressing consequences of maintaining the ‘status quo’ in addressing climate change and global warming. The concern is that humans (not just polar bears!) will be unable to adapt to climate change by 2050 unless there is a shift in global mobilization and coordination, coupled with technological advances and policies easing the barriers to adoption, sustained over decades.

Ag-West Bio is pleased to work with innovative firms that do not accept the status quo, and continue to push the envelope on developing and commercializing sustainable bio-solutions, products, and alternatives. I am happy to report Ag-West Bio has a 26 year history in facilitating the commercialization of environmentally sustainable bio-based technology. You can read about some of these firms in this annual report. We are delighted to assist these companies, and many others, on their road to success. By doing so, we expand Saskatchewan’s already vibrant bio-economy.

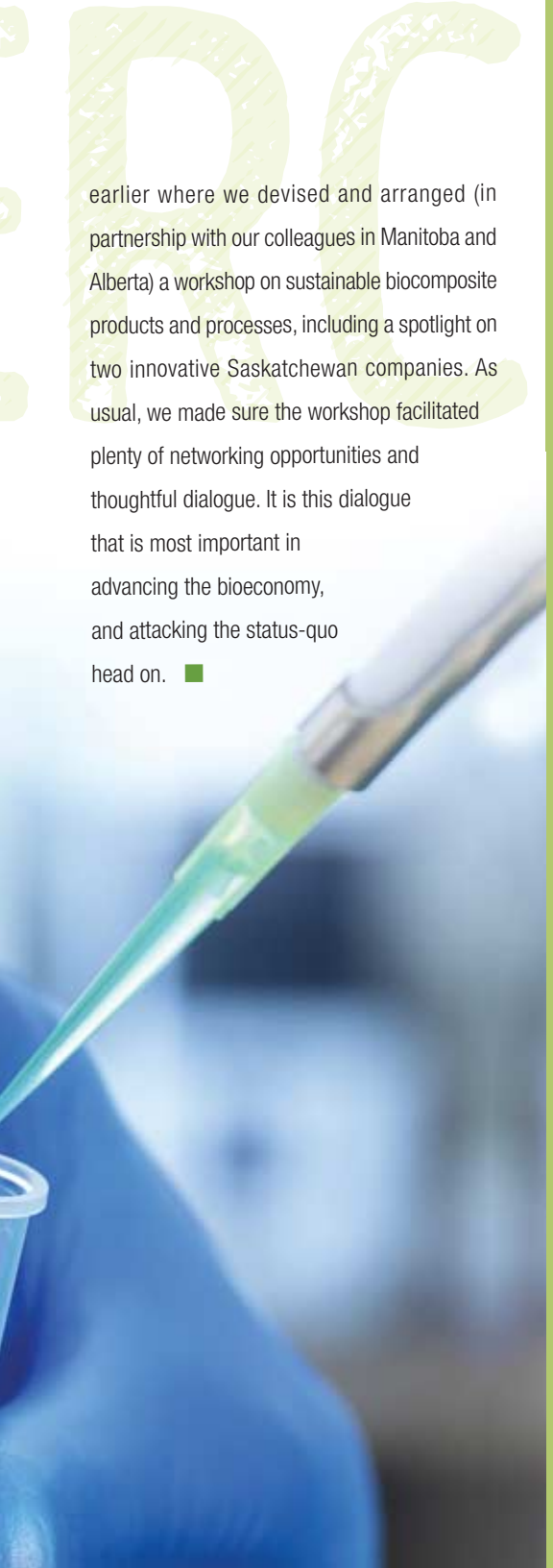
Saskatchewan firms are developing exciting technologies, products and solutions: from biodegradable (and compostable) flax based consumer products; Prairie Carnation and grain-based industrial chemicals; plant-based biocomposite products and processes for industrial and consumer markets; innovative crops (feedstock) for bio jet fuel manufacture; sustainable alternatives to wastewater management and water recovery; and there are many more examples.

This past year Ag-West continued to offer a suite of diverse services to advance the success of promising bio-based technology firms. These services included investment readiness, strategic and competitive intelligence, links to advisory input and networks, and investments and leveraged capital services from our Technology Commercialization Investment Fund.

In addition we facilitated company participation, spotlights and networking events locally and at key international conferences.

The best example of this is the World Congress on Industrial Biotechnology conference mentioned

earlier where we devised and arranged (in partnership with our colleagues in Manitoba and Alberta) a workshop on sustainable biocomposite products and processes, including a spotlight on two innovative Saskatchewan companies. As usual, we made sure the workshop facilitated plenty of networking opportunities and thoughtful dialogue. It is this dialogue that is most important in advancing the bioeconomy, and attacking the status-quo head on. ■



CORPORATE INITIATIVES 2014-2015

What's the Score?

Mike Cey (left) with Yuancheng Wang, President and CEO of Mandi Seed Co. in Saskatoon

By Mike Cey, Director of Corporate Initiatives

Ag-West Bio has completed an analysis of Saskatchewan's agriculture bioscience research and development strengths.

Public and private organizations have been interviewed, surveyed and analyzed, and a scorecard will be released in the coming months. This scorecard will provide a benchmark that we can use in the future to help guide the provincial objective of strengthening our global leadership in agricultural biosciences.

Feeding the fish

Camelina oil and meal is enjoying newfound market interest as a preferred substitute for fish meal in the ever growing aquaculture market. Fish meal based on natural supplies of ocean fish is in short supply, and camelina holds the promise for a sustainable, scalable substitute. In partnership with member company, Linnaeus Plant Sciences, we attended, exhibited and presented at the Aquaculture Canada 2015 conference in order to advance camelina in this space.

Welcome to Saskatchewan

Delegations from Japan, France, India, China and others were hosted in efforts to attract new international companies with innovative products, processes and technologies. An outstanding combination of public and private bioscience R&D capacity, combined with a collegial and supportive approach is resulting in several new companies investigating and focusing on set up or relocation within Saskatchewan.

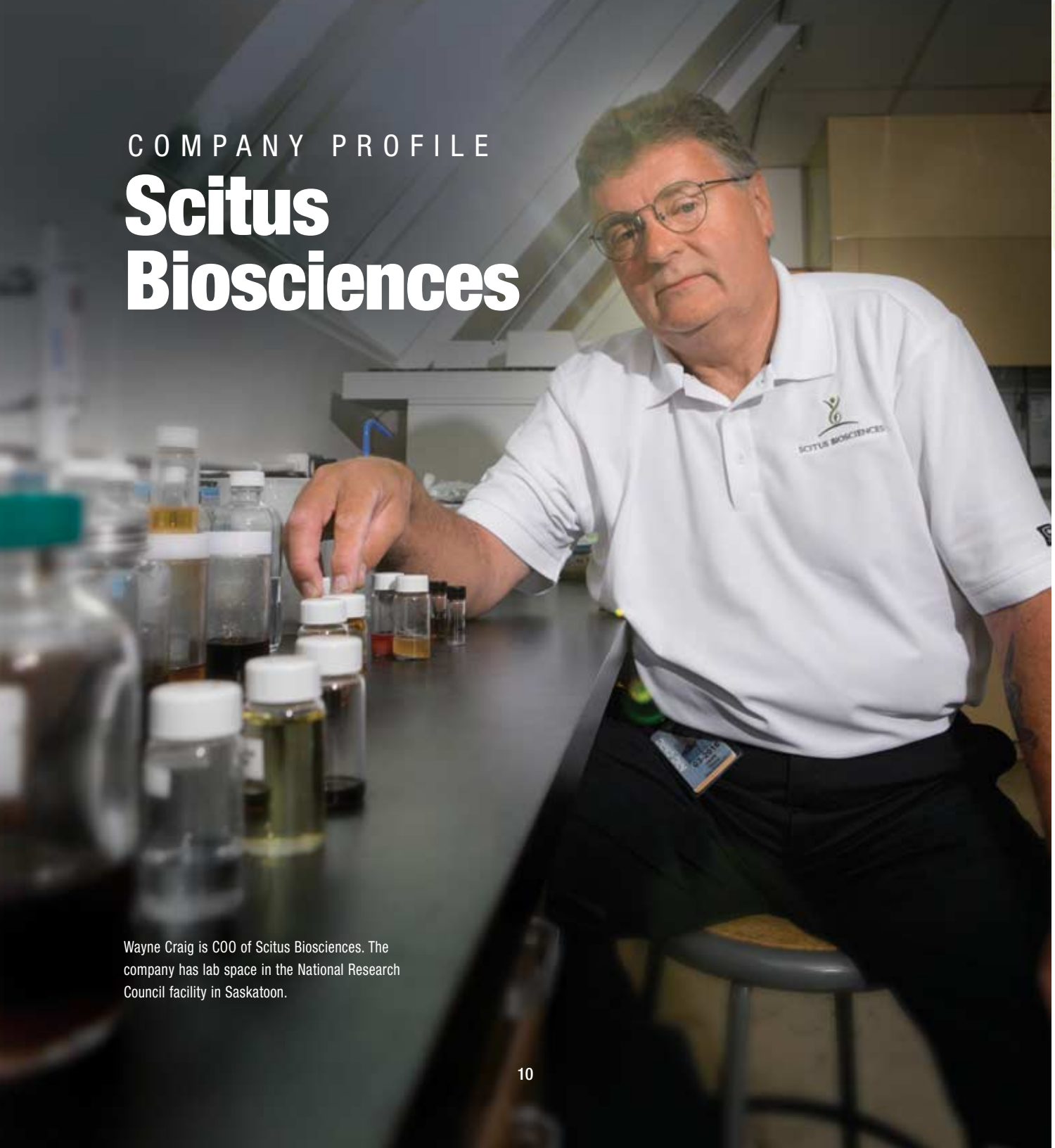
Bringing it to the world

Once again this year, Ag-West Bio led delegations and exhibited at BIO International Convention in Philadelphia and World Congress on Industrial Biotechnology in Montreal. Activities included a Bioproduct Supply Chains in Action Workshop and a networking event, both in partnership with Alberta and Manitoba. At BIO we co-hosted a networking reception with Life Sciences Association of Manitoba and hosted a business speed dating event. Efforts to attract new small and medium enterprises to the Saskatchewan cluster included presentations at the Agri-Innovation Forum in Winnipeg and the Canadian Bioeconomy Conference in Toronto.

Through initiatives such as these, Ag-West Bio continues its key role as the catalyst for Saskatchewan's bioeconomy. ■

COMPANY PROFILE

Scitus Biosciences



Wayne Craig is COO of Scitus Biosciences. The company has lab space in the National Research Council facility in Saskatoon.

At Ag-West Bio, we are privileged to work with creative, ambitious entrepreneurs who strive to achieve business success. The following pages profile three Ag-West Bio member companies that exemplify the talent and drive we find in Saskatchewan's bioscience sector.

Putting nature to work

As industries and consumers continue to look for 'natural' alternatives to everyday products, someone needs to be actively discovering new uses for plant based compounds. That's exactly what Scitus Biosciences does.

The company's long term vision is to become a leader in the development of proprietary technologies that utilize the unique properties of plants for therapeutic, cosmetic, dietary, antimicrobial, antibacterial, and agricultural uses.

"We believe we have all the key elements of success: A strong, competent and well-rounded team with a successful track record; a large and fast growing target market that is actively pursuing the products we develop; and a pipeline of effective technologies and formulations," says Chief Operating Officer Wayne Craig.

With a team of dedicated researchers and professionals, Scitus strives to discover natural compounds and create unique formulations to "put nature to work."

"The interest in effective natural alternatives has never been higher. That is something we intend to capitalize on," says Craig.

According to Craig this is a new era in scientific research. He highlights the impressive increase in the number of research projects that seek to examine how we use plants. New discoveries about the unique attributes of plants are happening regularly and scientists are gaining a deeper understanding of the myriad ways plants can positively influence everyday life.

Having already developed Advir, a cold sore treatment made from plant extracts, Scitus is providing technologies and formulas that will address the worldwide problem of microbial resistance to synthetic drugs, therapies and pesticides.

While there are plenty of opportunities working within agriculture and pharmaceuticals, Scitus is also looking to provide eco-friendly, plant-based solutions for consumer products, such as cosmetics.

Craig says forecasted growth is being driven by a consistently increasing consumer demand for organic and natural products, adding "This demand is being further driven by increased government scrutiny on synthetic and chemical products and the ever increasing restrictions associated with their use."

The team behind Scitus has more than 60 years of combined experience in the successful identification, isolation, and commercialization of plant-based technologies for the pharmaceutical, agricultural and food sectors. And for Craig, the quality of the team is a key ingredient to the company's success.

Another significant factor for success is having access to state-of-the-art facilities and leading researchers in Saskatchewan. "Our presence in the National Research Council (NRC) building, being close to the cluster of companies found within Innovation Place, and the leading personnel at the University of Saskatchewan (U of S) provides us with a plethora of people to not only turn to for expert advice, knowledge and direction in specialized areas, but also a strong pool of potential employee candidates," says Craig.

The problem, as it is with most new businesses, is finding the capital needed to put their ideas into motion. Having received support from the NRC's Industrial Research Assistance Program, Scitus was able to mitigate risk involved in conducting significantly sized research projects. As a result, Scitus has been able to identify new areas for growth and align with major strategic partners.

Scitus also found support from the U of S Industry Liaison Office (ILO) and the Tech Venture Challenge. This valuable experience forced them to perfect their business plan and assumptions, review initial target markets and polish the company's 'story' and pitch.

Planning ahead, Scitus hopes to secure funding through the Ag-West Bio Commercialization Fund in the near future. According to Craig, the appeal of this program is more than just the financial assistance, but rather the direct access to experts, knowledge, and guidance to assist them with competitive analytics and market research.

Craig offers one piece of advice to potential startups in the bioproducts industry: build a great team. "Working within a startup provides an environment like nowhere else. There are so many benefits to a complementary team: the workload is shared, allowing the company to do more in a shorter period of time; it's easier to secure capital; and, great team members will spur each other on by driving ambition, creativity and energy that pushes the company to new heights."

http://scitusbio.weebly.com. ■

COMPANY PROFILE

Canadian Carnation BioProducts Company

Michael Oelck checks a Prairie Carnation crop near Waldheim, SK.

One flower, many bioproducts

In the race to find viable sustainable solutions to environmental challenges, bioproducts come out on top as effective solutions. They are natural and renewable, and create a wide range of opportunities for nearly every kind of industry, ranging from mining to human health.

Canadian Carnation BioProducts Company (CCC) is a leading player in Saskatoon, developing several bioproducts to meet important industrial and manufacturing needs, from agriculture to energy, from animal science to human health. And the majority of the CCC's products come from the Prairie Carnation® crop. Prairie Carnation is a new brand name for *Saponaria*, a genus of the plant known since antiquity as Soapwort.

"Canadian Carnation BioProducts has developed new bioproducts by extracting biochemicals from plant grains," says company president Michael Oelck. "Bioproducts are the megatrend of our time. Many companies are recognizing they need to become more sustainable, which creates a lot of opportunities, because bioproducts from plants are environmentally sustainable products."

Collaborating with POS Bio-Sciences and the University of Saskatchewan (U of S) for extraction, CCC produces carnation grain to manufacture

the finest starch, saponins (a natural, soapy substance made by the plant), feed protein, and valuable biochemicals such as antioxidants and bioactive peptides. The company plans to set up a pilot plant near Saskatoon to keep production costs low. Oelck says CCC is seeking Saskatchewan investors to help make this happen.

CCC works with Agriculture and Agri-Food Canada and the U of S as a seed company, developing new varieties for good field performance and large-scale production. Offering farmers one-year contracts, CCC provides the seed for seeding, visits the fields, and provides consultations throughout the growing season. Making the seed part of the contract means the farmer has relatively low risk and is paid for the amount of cleaned seed delivered to CCC.

> **“Bioproducts are the megatrend of our time.**
> Many companies are recognizing they need to become more sustainable, which creates a lot of opportunities”

Working with the National Research Council (NRC) and the Industrial Research Assistance Program, CCC also produced a large number of double haploid seed lines to be used for the breeding process. This allows the company to produce proprietary carnation cultivars, which will be pure breeding for all traits.

The company continually looks for new opportunities and will acquire other crops to produce value-added bioproducts for specific industries, such as the potash fertilizer industry in Canada. For example, CCC processes starches to be used as mining depressants, (which help separate minerals). It also processes grain containing a foaming agent, which can be used as a frother (a method of separating valuable minerals from low value materials). The result is an alternative most potash mines can apply, turning their fertilizer production into a more sustainable operation.

“There is tremendous value in creating industrial crops,” says Oelck. “Having access to the best resources in Saskatchewan allows us to prove that bioproducts have high value and can replace products from synthetic chemistry.”

As the company grows, so does the number of research projects it undertakes, looking for new and innovative ways to use the Prairie Carnation® crop to provide more industries with sustainable solutions to their everyday processes. For example, working with R&D organizations, including the Saskatchewan Research Council and Innovation Saskatchewan, CCC was able to examine and obtain positive results for a biosurfactant in the green energy sector. These biosurfactants have also proven to be useful in the clean up and remediation of mature oil wells.

While producing bioproducts for business customers has proven to be fruitful for the company, Oelck is also looking to make advancements in health related fields. Perhaps the most exciting research of NRC with CCC has been in partnership with the Cancer Research Centre in Saskatoon. Together, they have discovered that carnation-derived natural products known as saponins have selective effects, causing cancer cells to die while healthy cells survive. The largest research hospital in Berlin, Charité, is now actively testing them, thanks to the previous work of John Balsevich when he was a researcher at NRC in Saskatoon.

With several product development endeavours taking place at CCC, a large part of its success stems from the ability to collaborate and connect with other bioproduct businesses. Connections that were catalysed through Ag-West Bio have proven to bring long lasting business benefits to CCC and Oelck expects them to grow even better in the future.

“We have experienced Ag-West Bio as one of the best catalysts for bioproducts and crop based businesses in Canada,” says Oelck. “The leadership at Ag-West Bio is outstanding and was demonstrated again at the large International Rapeseed Congress 2015, as well as in ABIC conferences and many other events before.”

www.carnationbioproducts.ca

COMPANY PROFILE

Open Mind Developments

Jeremy Lang displays OMD's biodegradable Pela Cases.

Better solutions from Saskatchewan flax

Open Mind Developments (OMD) has one core value, rooted in a simple concept most of us learned as kids: leave the global campsite cleaner than the way you found it.

With that in mind, OMD has set out to make the world a better place by providing eco-friendly, plant-based alternatives to conventional products, such as plastic.

"We want to find better solutions to today's problems," says founder Jeremy Lang. "When sustainable products are the new standard, we'll all be a little better off."

The idea first sprouted when Lang was a young child living in Saskatchewan and noticed acres upon acres of flax straw 'waste' set intentionally ablaze. Even as a child, Lang wondered if there was a better use for the straw.

As an adult, Lang noticed a surprisingly large volume of plastic garbage on beaches and in nature, and started to wonder if the two problems could have one solution. Through research, networking and support from Ag-West Bio, OMD created Flaxstic™, an alternative to plastic made with plant-based materials.

Flaxstic™ combines annually renewable crops such as flax straw waste with biopolymers sourced from non-food crops to create a strong and

functional material that looks and feels like plastic. Unlike plastic, however, this material is biodegradable and compostable, making it more eco-friendly.

In 2011, OMD launched a line of iPhone cases called the Pela Case, which demonstrates potential real-world applications for Flaxstic™ and provides consumers with an attractive, sustainable option for keeping their smartphones safe.

Based in Saskatoon, OMD practices under the value of being as socially responsible as they are eco-friendly. Striving to be an active participant in the local economy, they source materials from as many local farmers and manufacturers as possible and they employ as many local residents as they can.

"Saskatchewan is one of the largest oilseed flax producers in the world, which means there are a lot of farmers here that have flax straw waste. We are trying to help provide them with another market for their flax straw," says Lang.

As a result, the company is able to provide farmers with an additional source of revenue from what would otherwise be considered waste.

Because of their prairie location, OMD has easy access to a variety of vital suppliers and researchers to help ensure the entire product, from source materials to product packaging, is eco-friendly. According to Lang, the connection OMD has made with Ag-West Bio has been a key ingredient to success: "It's not just that they have helped us financially, but their support in providing good connections and resources means they have given us the edge we need to be successful," he says. "Being able to connect with other entrepreneurs and companies is key for any startup."

Recently, Open Mind Developments presented at the World Congress on Industrial Biotechnology conference, along with fellow biomaterial companies from Saskatchewan, Alberta and Manitoba. "Without Ag-West Bio, there would not have been the opportunity to showcase and present our story at the global level," says Lang.

Having access to the Saskatchewan research cluster means the company can continue their work as leaders in sustainable innovation and create new plant-based alternatives to plastics using different source materials. Currently in development is a plastic made from a biocomposite material consisting of plant-based biopolymers and hemp components, called Hempstic™.

"The opportunity to be part of this network has been one of the most positive aspects in our success," says Lang. "There are so many great things happening in the biotech world, many of which are happening right here in Saskatchewan, and we have access to a lot of them."

As the company continues to grow and expand, OMD is able to find new research and supply partners enabling the company to think smartly about the future of their product line. Currently exploring processes for a second and even third generational use for old and unwanted Pela Cases, OMD will soon be expanding to include biodegradable plant-based sunglasses, flip-flops, and yoga mats.

www.openminddevelopments.com

COMMUNICATIONS AND EVENTS

Encouraging collaboration

The 14th International Rapeseed Congress drew 850 attendees from 33 countries. Field tours were co-hosted by Agriculture and Agri-Food Canada, BASF, Bayer CropScience, Canola Council of Canada, Cargill, Crop Production Services, Dow AgroSciences, Monsanto, and SaskCanola.

Ag-West Bio events

Building community and promoting Saskatchewan's bioscience sector continue to be top priorities at Ag-West Bio. To achieve these goals, we manage events of all sizes, from luncheons and half-day seminars or workshops, to major conferences.

This year we organized two international conferences: The Agricultural Bioscience International Conference (ABIC 2014, October 5-8, 2014) and the 14th International Rapeseed Congress (IRC 2015, July 5-9, 2015). The feedback we've received on both the events has been overwhelmingly positive.

ABIC 2014 brought together 370 people from 16 countries. With the theme "Global Leadership in a Changing World," the conference focused on the challenges and opportunities in commercializing bioscience technologies. Speakers were of the highest calibre and included Norman Borlaug's granddaughter, Julie Borlaug (Norman Borlaug Institute for International Agriculture). A lecture by Ingo Potrykus, the inventor of Golden Rice, was a treat. Potrykus expressed his hope that the technology will reach the farmers who need it, but also his frustration at how slowly the process is moving.

While ABIC focused on the business of biotechnology, IRC 2015 was a scientific event. With 35 keynote lectures and 175 oral presentations in five consecutive streams, attendees had no trouble finding information to suit their areas of interest. A highlight was a lecture by Keith Downey, known as one of the "Fathers of Canola." He gave the audience a canola history lesson and emphasized how important it is that science earns the trust of the public.

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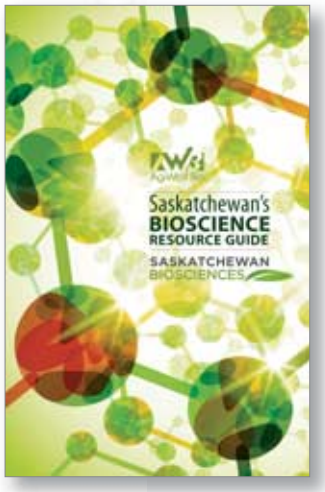
Left top: Ingo Potrykus at ABIC 2014.

Left bottom: Wanuskewin Heritage Park First Nations drummers and dancers performed at the 14th International Rapeseed Congress Opening Ceremony

Left: Keith Downey delivered the keynote lecture at the IRC 2015 Welcome Reception

Above: Saskatchewan Research Council made science fun at Ag in the City.



Right: The Saskatchewan BioScience Resource Guide is a valuable promotional tool that Ag-West Bio uses to illustrate the variety of companies in the province's bioscience sector.

Below: Wilf Keller with reporters at ABIC 2014 in Saskatoon. ABIC drew 370 delegates from around the world.

Ag-West Bio also organizes the Canola Industry Meetings (CIM) in December of each year. CIM began as a small meeting organized by Keith Downey in the early '70s to devise a plan for contracting the first canola varieties to producers. The event has grown annually and now draws nearly 300 attendees.

Innovation Place Saskatoon continues to be a hub of activity. We hold numerous networking events in the award-winning facility, introducing newcomers to the community. In the past few months we have hosted Kishor Wasan (Dean of Pharmacy and Nutrition, U of S); Maurice Moloney (Executive Director of the Global Institute for Food Security); and Neil Alexander (Executive Director of the Sylvia Fedoruk Canadian Centre for Nuclear Innovation).

We continue to support the Raj Manek Foundation Mentorship Program, and co-hosted a seminar series for entrepreneurs. Other business-focused events this year included a Google Tips and Tricks seminar; and The Marketing Strategy Jump-Start and Trade Show Intelligence Lunch & Learns, co-hosted with Innovation Place.

With Wilf Keller serving as Saskatchewan's Chapter Chair of the Ernest C. Manning Awards Foundation, Ag-West Bio has been chosen to host the Manning Innovation Awards at Prairieland Park in Saskatoon. These awards are considered to be the most prestigious innovation awards in Canada, and we are pleased to be involved.

As a proud member of Saskatchewan's bioscience community, we partner in outreach activities like Ag in the City at the Lawson Heights Mall. The ag community gets behind this fun event, from commodity groups to the key agriculture research organizations, such as Agriculture and Agri-Food Canada, the Saskatchewan Ministry of Agriculture, the Saskatchewan Food Industry Development Centre, Ag in the Classroom, and the University of Saskatchewan. Ag-West Bio coordinated a 'Science Zone' at the event, inviting scientists to set up hands-on activities to engage visitors.

National Biotechnology Week continues to be an important vehicle for spreading a positive message about bioscience. Ag-West Bio coordinates Saskatchewan's activities, with the help of a local committee, to host industry events like Biotech and Beer at Boffins, and outreach events such as lectures, workshops and dances. The Amazing Biotech Race, an annual scavenger hunt at Innovation Place in Saskatoon, brings post-secondary students face to face with bioscience businesses.

Spreading the word: Ag-West Bio communications

Communication is key to the success of any business and continues to be an essential aspect of Ag-West Bio's work. This includes sharing information within the bioscience sector, promoting Saskatchewan to the world, and reaching out to the general public.

We do this in a number of ways. Staff members make personal visits within the community to ensure we have firsthand knowledge about what is happening at home, and we spread the word about Saskatchewan's research and business capabilities at international conferences. The Saskatchewan BioScience Resource Guide (our 'Green Book') is a valuable promotional tool. And of course, we use the worldwide web to engage in social media.

Our guest blogs continue to be popular, covering a broad range of topics, from genetic modification to business tips from the experts. Our following on Twitter is growing (@agwestbio). The quarterly Bio-Bulletin contains articles about our research and biobusiness community. The Ag-West Bio website is currently undergoing an update to make it 'mobile friendly.'

This spring, Ag-West Bio commissioned Ipsos-Reid to conduct a Canada-wide survey questioning 2000 consumers about their food purchasing habits. This information will give food ingredient and product companies invaluable insight. Small and medium enterprises and partners were given priority viewing. Results will be available soon.

For updates on events and communications activities and membership information, visit **www.agwest.sk.ca**

Below: The Saskatchewan Food Industry Development Centre assists local companies to create healthy ingredients and products from the huge variety of crops grown in the province.

Above: Ag-West Bio commissioned a survey questioning consumers about their food purchasing habits.

Become an Ag-West Bio member!

We would like to thank all of our members for supporting our activities. By working together to grow the provincial bioscience sector, we strengthen Saskatchewan's economy in general.

Visit our website to view member profiles.

Financial statements are available upon request.

Growing Forward 2
A federal-provincial-territorial initiative

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The wheat art on the cover and page 4 comes from a phase contrast X-ray image, courtesy of the CLS.

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