# 25 YEARS OF GROWING BIO-BUSINESS IN SASKATCHEWAN

2013 - 2014 ANNUAL REPORT



**Recognized by its** sunny-yellow flowers that contrast so beautifully with the 'living sky' of the prairies, canola was developed right here in Western Canada!

### ABOUT THE FRONT COVER

The canola story was one of cooperation, with a dedicated group of researchers from Agriculture and Agri-Food Canada, the National Research Council and the University of Manitoba working together to develop an edible form of rapeseed, a crop that grew well in the harsh





prairie climate, but was not considered edible.

Keith Downey and Wilf Keller (pictured here) are two Saskatchewan scientists who played key roles in the development of canola, which has become Canada's most valuable crop and a poster-child for agbiotechnology.

More about canola

Dr. Downey earned a place in the Canadian Agricultural Hall of Fame (along with Dr. Baldur Stefansson, University of Manitoba) for developing the first varieties of canola, derived from rapeseed using traditional plant breeding techniques. Dr. Keller's work contributed to the first herbicide resistant variety of canola, Innovator. His contributions to the industry continued at the National Research Council, where he oversaw canola genomics programs.

Both sit on the 14th International Rapeseed Congress (IRC2015) Steering Committee. IRC2015 will be held in Saskatoon next summer from July 5-9, co-hosted by Ag-West Bio and the Canola Council of Canada.

## VISION, MISSION AND MANDATE

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

**Mission Statement:** To accelerate innovation and enable organizations 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.

# A MESSAGE FROM THE Saskatchewan Ministry of Agriculture



**Congratulations to Ag-West Bio** for being a leader in agricultural innovation for the past 25 years. Thanks in part to your guidance and dedication, Saskatchewan has become a leader in the biosciences. Ag-West Bio has made significant contributions to the benefit of the agriculture industry right here in Saskatchewan and around the world.

Agriculture research is a priority for our government. We want to foster a prosperous and sustainable agriculture and food sector and that is why we continue to support Ag-West. Ag-West Bio's ability to move research into market is an important role in the transfer of technology from the lab to the field, and is vital to achieving our goals set out in the Saskatchewan Plan for Growth. Through ongoing support we are confident that Ag-West Bio will continue to drive innovation to benefit the agriculture sector and Saskatchewan's economy.

Biotechnology and agriculture research builds on Saskatchewan's natural advantage as a leader in primary production. By making innovation a priority, and investing into the biosciences, our industry will continue to be profitable and competitive. This will ensure Saskatchewan remains a reliable producer of safe food. Continued advancements in agriculture research will benefit not only Saskatchewan, but people all over the world, who look to Saskatchewan as a leader in agriculture technologies and practices.

Thank you Ag-West Bio for your leadership and dedicated service for the past 25 years. I know that your next 25 years will bring even better things for Saskatchewan.

Lyle Stewart Minister of Agriculture

# PRESIDENT'S Message



we need continued OUTREACH & EDUCATION in an era where skepticism regarding the value of new technologies continues to thrive

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In the 1980s, the Government of Saskatchewan predicted that developments in science and technology would lead to major changes in the province's agriculture industry. With this in mind, Ag-West Biotech was created to advocate for the application of emerging biotechnologies and to catalyze the growth of the Saskatchewan ag-bioscience cluster. As we look back on the past 25 years, it is evident that the provincial government was correct in its view.

With Murray McLaughlin as the first president of Ag-West Biotech (the name changed to Ag-West Bio in 2004), solid and successful operational principles were established and continue to serve the organization well. Ag-West quickly attained local, national and international recognition in the early years. Through effective communications and outreach initiatives, Saskatchewan was clearly positioned as a leading centre for agricultural bioscience. In 1996, Ag-West led the organization of the first Agricultural Biotechnology International Conference (ABIC), which was subsequently held in other global centres and has returned to Saskatoon four times. The organization's leadership in engaging industry with regulatory agencies contributed to the commercialization of new crop varieties and agricultural products. Since its establishment, Ag-West has been active in industry attraction and supporting new company growth, with a total of \$12.9 million direct investments made since 1989. Ag-West's proactive stance in publicly communicating the benefits of science and technology should also be noted amongst its contributions.

The Provincial Plan for Growth resolves that Saskatchewan will be recognized as an international centre for bioscience by 2020. Ag-West Bio will have both the opportunity and responsibility to contribute to the achievement of these ambitious goals: To meet the challenges of effective adoption and application of new technologies, including genomics, bioinformatics, nanotechnologies, imaging methodologies and agronomic practices; to address the global challenge of feeding a hungry world through sustainable production practices; to strengthen established initiatives and foster new programs along with renewal of our human resource base; and finally, to not lose track of the need for continued public outreach and education in an era where skepticism regarding the value of new technologies continues to thrive. I believe that Ag-West Bio, through its catalytic approach, will effectively address these challenges and take advantage of new opportunities.

It is a pleasure to acknowledge the individuals and organizations that have contributed to Ag-West Bio's important role in Saskatchewan. First, Ag-West's staff dedication and team commitment in undertaking tasks is second to none. Next, thank you to our volunteer directors for past and ongoing contribution of time and energy; their role in guiding the strategic direction of the organization has been a major factor in our success. Finally, we gratefully acknowledge the Saskatchewan Ministry of Agriculture for its ongoing financial support, in association with its partnership with Agriculture and Agri-Food Canada, and for a willingness to demonstrate patience, with a long-term view for success.

Defler,

Twenty five years ago I was an ambitious, young entrepreneur with the dream of building a company from scratch in Saskatchewan, using new technologies that were creating exciting opportunities in an emerging bioscience industry.

**LETTER FROM** 

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There will always

be challenges.

but as they say,

nothing worth

having comes

WITHOUT A FIGHT

THE CHAIR

I feel fortunate that shortly after I started my company, the provincial government decided there was a need for a catalyst to accelerate the agbiotech sector. In 1989, Ag-West Biotech was launched, with a mandate to provide leadership to the industry, along with a commercialization fund to help startups survive the so-called 'Valley of Death,' when funding is crucial but extremely difficult to obtain.

As someone who benefitted from Ag-West Bio business support and funding, it would be hard for me to exaggerate the important role Ag-West Bio has played in the success of numerous companies, and in the overall growth of the bioscience industry in our province.

Today I'm still enthusiastic about the industry in Saskatchewan, and grateful to be in a position to give back to the community and to share my hard-won knowledge with upcoming entrepreneurs.

Much has happened in the past 25 years; companies have come and yes, some have gone. There will always be challenges, but as they say, nothing worth having comes without a fight. As Saskatchewan's bioscience industry association, Ag-West Bio continues to provide business support, mentorship and commercialization funding, to catalyze industry initiatives, and to foster connections by providing numerous networking opportunities, the value of which cannot be overstated.

On behalf of Ag-West Bio's Board of Directors, I would like to thank the Saskatchewan Ministry of Agriculture for a quarter-century of unwavering support. Thanks also to Agriculture and Agri-Food Canada for support through Growing Forward 2. A big thank you 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 the next 25 years of growing biobusiness in this great province!

**Brent Zettl** 

# 25 YEARS OF Growing Biosciences

Ag biotech

is one of the

few sectors

that has a

MULTI-BILLION

**DOLLAR MARKET AT** 

**ITS BACK DOOR** 

A lot can happen in 25 years. That is especially true in the agriculture sector, where the introduction of agricultural biotechnology has led to dramatic changes in the last two and a half decades. Ag-West Bio has been a champion of Saskatchewan's ag biotech sector every step of the way.

### The history

In the late 1980s the Government of Saskatchewan began an analysis of the province's ag biotech industry and soon realized that the biggest gap was in marketing; it was determined that an organization was needed to facilitate, coordinate and promote ag biotech on a global scale.

"Saskatchewan already had the research infrastructure. It also had programs

**252 MILLION** 

additional

funding leveraged

after AWB

investments

for commercialization of technology that were so successful they were replicated by others," says Royal Hinther, at the time a policy analyst involved in the strategy.

The University of Saskatchewan (U of S), the National Research Council Canada (NRC) and Agriculture and Agri-Food Canada (AAFC) labs provided the foundation of research infrastructure; German life science company Hoechst had transferred its canola

research infrastructure; German life science company Hoechst had transferred its canola research to Saskatoon, and the city had a few biotech companies, including Philom Bios and Micro Bio Rhizogen. That, combined with some hard work

and political will was enough to get the fledgling cluster off the ground.

A 1980's analysis of the province's ag biotech industry revealed that the biggest gap was in marketing.

The Government approved a strategy that recommended the creation of a marketing and networking organization, and committed funding of \$9





million over five years. "The convincing argument," remembers Hinther, "was 'ag biotech is one of the few sectors that has a multi-billion dollar market at its back door; expenditures by farmers for agricultural inputs are \$5 billion.' This was a way to add value to an existing industry."

The new bioscience industry association, Ag-West Biotech, was the first of its kind – it was something other jurisdictions did not have. It was unique in that it was connected to the community and had support from all stakeholders, from the public research institutions, to all levels of government and industry. The name was shortened in 2004 when the company merged with the Saskatchewan Bioproducts Association and the Saskatchewan Nutraceutical Network.

Murray McLaughlin, the organization's first president and CEO, says timing was important. "The cluster in Saskatoon realized that agricultural biotechnology would be important to Saskatchewan from a research and

individuals

have served

on AWB's

**Board of Directors** 

70

investments

in 57 companies

business perspective."

The priority for Ag-West in the early days was business attraction and education. Plant Genetic Systems Inc. out of Belgium, with a novel hybrid system, was a key target. The company had no revenue, but in spite of that, the belief was, 'if you get them, everyone else will follow.' The plan worked.

The second order of business was educating both the research community and international business interests about what Ag-West Biotech was, and what Saskatoon had to offer: Research capacity and business support. "We had to explain to researchers the importance of connecting their research to commercial opportunity," says Hinther.

Outside recognition was quick to appear. McLaughlin remembers, "About three years into our mandate, a researcher was at a World Summit. He reported back that when he said he was from Saskatoon, four of the five international scientists at the table told him that they considered Saskatoon a leading centre for ag biotech." From then on, he was comfortable referring to Saskatoon as a 'world leader.' The cluster in Saskatoon realized that

### agricultural biotechnology WOULD BE IMPORTANT TO SASKATCHEWAN

77



Murray McLaughlin was the organization's first president and CEO

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**189 THOUSAND** 

average amount invested by AWB in privately held companies



Established in 1980, Innovation Place is one of the most successful university-related science and technology parks in North America. Located beside the University of Saskatchewan in Saskatoon, it is home to approximately 130 clients employing over 3,300 people in 20 buildings across the park. Photo courtesy Innovation Place (1987).

To increase research capacity in the cluster, a steering committee that included the Mayor of Saskatoon, Saskatoon Regional Economic Development Authority (SREDA), the Government of Saskatchewan, Ag-West Biotech and the U of S, pushed for the relocation of numerous AAFC research positions from Ottawa to Saskatoon. That, and the previous rebranding of NRC's lab as the Plant Biotechnology Institute, and ultimately, the Canadian Light Source (CLS) synchrotron, rounded out the community.

Once again timing proved right for the organization, as the right people seemed to be in the right places at the right time. There was support from Innovation Place, Limagrain moved to Saskatoon and John Hyshka was hired at SREDA. Innovation Place built research greenhouses to support the

sector and the federal and provincial agricultural ministers were supportive of developing the ag biotech industry in Saskatchewan.

John Cross, founder of Philom Bios, echoes the sentiment. "We had political impetus, initiatives from the University, recognition from academia that biological sciences were a pathway to the future. NRC and AAFC were on board at the same

**1.2 BILLION GDP** impact of the **\$12.9M** invested by AWB since 1989

Below: The Canadian Light Source (CLS) is a world-class, state-of-the-art synchrotron facility located at the University of Saskatchewan in Saskatoon. Since beginning operations in 2005, the CLS has hosted over 2,000 researchers from academic institutions, government, and industry from 10 provinces and two territories; delivered over 32,000 experimental shifts; received over 8,300 user visits; and provided a scientific service critical in over 1,000 scientific publications.

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different technologies in which AWB has invested time. Ag-West further contributed that feeling of enhanced capabilities."

With investments in more than 50 companies, hundreds of events organized to bring researchers and entrepreneurs together from around the globe, and hosting delegations from dozens of countries, the value of Ag-West Bio can be seen in the hard numbers.

Abdul Jalil, Executive Director, Agriculture Research Branch at the Saskatchewan Ministry of Agriculture, reports, "Ag-West's strategic investments of an estimated \$12.9 million since 1989 has resulted in Gross Domestic Product impact of \$1.2 billion and created an estimated 3,375 person years of employment in Saskatchewan." A paper by Dr. Stuart Smyth (U of S) published in 2012 substantiates the economic impact of Ag-West Bio.

### The future

When Ag-West Bio was founded, not a single genome had been sequenced. Today genomics research is far more commonplace and affordable, and the potential applications are infinite. Genomics research itself is no longer based on technology development; it is primarily a tool available for commercial improvement of crops and livestock.

"There is a rapid evolution of biotech tools," says Ag-West Bio's president

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**?**? since 1989 AWB has hosted delegations from 22 different countries

and CEO Wilf Keller, "from DNA sequencing, to metabolic profiling, to synchrotron-based imaging, to bioinformatics. One can ultimately envision the creation of the virtual cell or plant."



### We'll continue to see emphasis on responding to societal demands for sustainable production of HIGH-QUALITY, SAFE FOOD WITH REDUCED CONTAMINANTS.

**3,275** person years of employment in Saskatchewan thanks to AWB investments (2,000 person years of research)



Ten years ago, there was talk of convergence among sectors, and that is now happening at a faster rate. "Research in the health of livestock and humans is growing in terms of innovation," says Keller. "Genomic profiling tools for health will move us to a more preventive strategy, and genomics will play a role in DNA-based diagnostics for diseases such as cancer. Similar tools are being used in developing improved varieties of crops and strains of livestock."

Bioremediation, which uses living systems to detoxify environments, is a growing field, notes Keller, "The interface of living systems of microbes and plants with mining and petroleum are growth areas from which Saskatchewan can benefit."

"We'll continue to see a lot of emphasis on building environmental quality, responding to societal demands for sustainable production of high-quality, safe food with reduced contaminants. There will be greater use of a plant's natural processes to reduce chemical input. This is already happening, and it will continue at an increasingly rapid pace." Murray McLaughlin notes the trend towards non-food oriented biofeedstocks. "In the next five years we'll see a move away from using food products for biochemicals, and move to non-food products of crops, such as straw and hulls. We'll be using waste components of crops and forests to develop bio-based industry."

There is emerging potential for using the CLS and the Sylvia Fedoruk Centre for Nuclear Innovation at the U of S in novel methods of plant imaging. "We're unique in having a synchrotron within walking distance from all of this agricultural research infrastructure," says Hinther, who is now the Director of Business Development at the CLS. "Plant imaging is the next big opportunity."

It appears the only limit to progress in the ag biotech sector is our imaginations — and possibly funding. Momentum lagged in Saskatchewan in the first decade of the 21st century, but today, public and private sectors are paying closer attention to what the industry needs to move forward, and working to close those gaps.

"The provincial government has set a goal to become a global leader in ag biosciences by 2020, and has increased its financial support to ag research in Saskatchewan more than 100 percent in the past seven years. Ag-West Bio will be key to the province reaching that goal," says Abdul Jalil.

John Cross is adamant that while the province's 2020 plan is encouraging in its support of bioscience, a return to the types of business incentives that existed in the late 1980s would be helpful. "If you invested a dollar, you got a 30-cent tax credit. Philom Bios used it. We need the same thing again."

With the rate of change in the ag biotech sector, there will be no resting on our laurels. McLaughlin notes, "Genetic engineering and canola are synonymous, and herbicide tolerant canola has had an obvious impact on the provincial economy. We still need to push for it and keep supporting it to stay on top."

Ag-West Bio's education component has changed, but is still paramount. While the cluster is on board, there has been resistance to ag biotech research and development. "The need for education is very important," says Keller. "We want the farm-to-table consumer to understand that all food products are the result of innovation over many years."

Ag West Bio's role continues to revolve around business development, networking and education in a rapidly evolving industry. The organization is shepherding a cluster through what McLaughlin describes as "continuous change in the future, as far as I can see." countries involved in the advancement of biotechnology through the ABIC Foundation

## 1.525 MILLION

invested in canola research during the 1990s resulting in \$300M annual benefits to prairie canola producers

### 25 TIPS FOR ENTREPRENEURS 25 years of

25 years of experience from Saskatchewan business leaders look for them in this section!

77 ade Commercialization QUESTIONS AND ANGWEDC





*by Brad Bly,* Director of Commercialization, Ag-West Bio

When you're in the early stages of developing your technology, read: "Blue Ocean Strategy"; when you are in any stage of developing your business, read: "How to Win Friends and Influence People. 77 Brad Bly Ag-West Bio

# **COMMERCIALIZATION: A QUARTER CENTURY**

Commercialization support has been a very important part of our work at Ag-West Bio from the beginning. Ag-West Bio can provide seed capital and help leverage additional funding for qualified, early-stage or expanding companies. Brad Bly, Director of Commercialization, touches on many aspects of commercialization in the following Q&A: Opportunities, like crowd funding; the importance of mentorship; and challenges, such as finding adequate resources.

What are some major milestones for Ag-West Bio?

Over the past 25 years we have had many milestones. Ag-West Bio created the world's premier ag-bio conference, the Agricultural Biotechnology International Conference (ABIC), held internationally. Ag-West has been recognized by Tourism Saskatoon for its dedication in bringing spectacular events to the city; and Ag-West's Technology Commercialization Fund has made unique investments, totalling \$12.9

> What are the biggest challenges facing Saskatchewan-based biotechnology companies currently?

million to more than 50 companies.

Human capital and financial capital. Commercializing bioscience requires heightened business development skills, and compensating individuals with these skills requires sufficient financial capital. Ag-West Bio works to fill these gaps by helping bioscience companies attain mentorship and advisory input, while our Technology Commercialization Fund can provide repayable investment capital for business development purposes.

#### What are the biggest opportunities for Saskatchewan biotechnology companies?

There are many opportunities, as Saskatchewan is poised to take advantage

of the increasing global focus on food security and environmentally sustainable products. We are respected globally for the magnitude and

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Celebrating Success: Ag-West Bio has had the pleasure of working with many highly innovative entrepreneurs over the past 25 years. We have featured six of these successful leaders in this publication.

# COMPANY FEATURE AGRISOMA BIOSCIENCES

ff Listen to your people, your investors, your customers and to the industry. You will learn about your business environment and how people see you. **17** 

Steven Fabijanski

ff Your success is not only judged by others but dependent on others. If you don't know them you don't know your business. )) Steven Fabijanski

> Steven Fabijanski, President and CEO, Agrisoma Biosciences Inc.

Agrisoma is an agricultural company with research labs in Saskatoon that has commercialized carinata, a non-food oilseed crop designed for sustainable production of biofuels. Carinata is a sustainable crop choice that provides a high quality oil and a high quality meal, while addressing the needs of growers for an oilseed crop that can withstand the continued challenges of farming in areas such as the southern prairies. Agrisoma sells carinata seed products under the Resonance<sup>™</sup> brand name, and uses advanced crop improvement technologies to provide superior crop varieties to growers. Carinata is the only crop from Canada - and one of only four crops globally - to carry the Roundtable on Sustainable Biomaterials certificate of sustainability, which sets universally recognized standards for sustainable crops for biofuels. Agrisoma is focused on commercial production of carinata in multiple regions to meet the growing international demand for sustainable biofuels. In October 2012 Agrisoma conducted the world's first 100% biojet flight using carinata, and demonstrated a significant reduction in emissions and greenhouse gas reductions with a crop-based advanced fuel. Agrisoma won BIOTECanada's Gold Leaf Company of the Year Award in 2014.



66 Be prepared to invest your social capital, as well as your financial capital, as every investment is ultimately an investment in people. JJ Mark D. Pickard InfraReady Products

**K** Know your target market and understand how your technology can provide value in that market, then direct your R&D efforts toward providing that value. **D** 

> Brad Bly Ag-West Bio

sophistication of our food production. That, and our research infrastructure, gives us a real advantage in developing new and sustainable technologies and products. Two of our companies exemplifying such leadership are Agrisoma Biosciences Inc. and Open Mind Developments.

### What steps are needed to address quicker commercialization of projects?

Commercializing bioscience is not usually quick; on the up-side however, the benefit from commercialization can be substantial. Mentoring and advice are extremely important steps. Bioscience start-ups that obtain experienced input early on have a better chance of getting to market faster. Similarly, the networks that develop from good advisory input help companies find the strategic commercialization partners needed to accelerate their goals.

### How does Ag-West Bio identify companies with strong potential?

Lots and lots of networking. Over the past five years Ag-West has hosted, on average, more than 15 networking events per year. These events can be as big as ABIC, with more than 500 delegates from around the world, or as small as local bioscience showcases that highlight exciting new research initiatives and companies for an audience of 40. These events, matched with our diligent involvement in the provincial research environment and our participation in relevant initiatives globally, keep us well-informed of opportunities.

# What community partners does Ag-West Bio work with and what is their role in the development of commercialization projects?

We have wonderful, informal and mutually beneficial relationships with numerous stakeholders. Just a few of the many partners on speed dial are: U of S Industry Liaison Office, National Research Council – Industrial Research Assistance Program (NRC-IRAP) and Saskatchewan Economic Development Association. Mentoring and education partners such as the Raj Manek Mentorship Program and CETAC-WEST are also very important in increasing the commercialization capacity of the companies we assist.

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In 1980 John Cross was a founding partner and later President, CEO, and Chairman of Saskatoon-based Philom Bios Inc. This company develops, manufactures, and markets high value microbial inoculants which increase farmers' profits by enhancing the fertility efficiency of

## COMPANY FEATURE PHILOM BIOS

G Pay little heed to what the customer says, yet watch intently what he does. JJ John Cross crops in an environmentally benign way. Products include the world's first commercial phosphate inoculant for all crops and the world's first combination phosphate and nitrogen inoculant for pulse crops. In 2007 Philom Bios had 75 employees and \$12.4 million in annual sales when it was sold to Novozymes for \$25.6 million. Novozymes BioAg Ltd. continues to operate in Saskatoon, employing 95 people.

John was also the founding Executive

Director of POS Pilot Plant Corporation (now POS Bio-Sciences). He is a model for Saskatchewan entrepreneurs, laying the foundation that led to the development of two world firsts: canola oil processing and deheated mustard. In 2012, POS Bio-Sciences' facility was renamed John & Charlotte Cross BioSciences Centre.

John Cross, founder of Philom Bios, founding Executive Director of POS Bio-Sciences The surge of the biosciences in Saskatchewan in the 1980s was cultivated by enlightened policies and programs at both the federal and the provincial levels, complemented by the vigorous growth of entrepreneurial initiatives in research and commerce in our province.

This vibrant environment was further enhanced by the incorporation of Ag-West Bio which has delivered scientific, marketing and financial support and guidance to countless individuals and organisations over the past 25 years. THANK YOU. AG-WEST! JOHN & CHARLOTTE CROSS BIOSCIENCES CENTRE

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#### What are the most prominent grant programs available for Saskatchewan biotechnology companies?

Key grant programs available to companies early on are: NRC-IRAP, which can provide non-repayable funding to promising companies at early stages; the Saskatchewan Agri-Value Initiative (SAVI) enables the development and expansion of companies in their efforts to add value to agricultural products; National Sciences and Engineering Research Council of Canada (NSERC), MITACS, and BioTalent Canada have unique programs aimed at helping companies fill human capital gaps and turn research into

**G** Read "The E-Myth Revisited: Why Most Small Businesses Don't Work and What to Do About It. **1** Gerber, HarperCollins, 2001 David Gauthier AWB Board Member

66 Be 100% open, honest and transparent. JJ Brian Rossnagel AWB Board Member commercialization; and of course, the Government of Canada's Scientific Research and Experimental Development (SR&ED) Tax Incentive Program is available to all technology companies.

#### Describe the nature of the private equity financing environment in Saskatchewan. What can be done to enhance this environment for companies to access capital?

The private equity financing environment in Saskatchewan is quite limited, but growing. Investment funds managed by Westcap Mgt. Ltd. and PFM Capital Inc. are interested in technology companies in the commercialization and growth stage, while we have seen PIC Investment Group Inc. display interest in promising companies at the pre-commercialization stage. At very early stages, capital is limited. However, the Saskatchewan Capital Network is gaining good momentum in building an angel investment environment and has facilitated investments through its work.

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Prairie Plant Systems Inc. (PPS) has a history stretching back to 1988, when current CEO and President Brent Zettl founded the company alongside two partners. Zettl was in his second year studying agriculture at the University of Saskatchewan, and his vision was to diversify western agriculture by cloning trees that would lead to a small fruit industry in Saskatchewan.

For the thirteen years after 2000, PPS

grew medical marijuana to supply the

Canada. With a change in regulations

launched April 2014, Health Canada

national program administered by Health

moved into the position as the oversight

medical cannabis. In anticipation of this

privatized marketplace, CanniMed Ltd.

body for the production and distribution of

## **COMPANY FEATURE PRAIRIE PLANT** SYSTEMS INC.

was launched as a wholly-owned subsidiary to PPS. On September 19,

**Expect the** 

unexpected.

Brent Zettl

2013 PPS and CanniMed became the first licensed producers of medical Brent Zettl. President and CEO. marijuana approved by Health Canada, and since that date CanniMed has Prairie Plant Systems. served as the retail distribution arm for cannabis products grown by PPS.

### The financial help we received through Ag-West Bio Inc. in the early years opened so many doors for us, while the **GUIDANCE AND** MENTORSHIP

THEY PROVIDED was just as instrumental.

### Do you see the crowd funding concept being an avenue of capital for the Saskatchewan biotechnology industry?

Yes: Crowd funding campaigns generally work for raising capital to fund initiatives that have social or environmental benefits. Bioscience research

**11** It's not where you start, its where you finish. **)** Brooke Dobni InnovationOne

If Focus, butbe prepared toadjust your plansand think aboutthe next productyou'll be producingeven if yourcompany isn'tthere yet. JJBrian RossnagelAWB Board Member

Funding

often involves products with significant public good, such as replacing petroleum or chemical-based products with natural bioproducts. I believe there is potential for bioscience companies to obtain crowd funding dollars if they can demonstrate substantial environmental benefit...along with an exciting new concept. Ag technology companies are now raising capital through crowd funding vehicles such as AgFunder.

#### Why did Ag-West Bio partner with the Raj Manek Mentorship Program and what are the benefits to program participants?

Ag-West Bio has been working with entrepreneurs for 25 years and we know from experience that mentoring and advisory input are critical to success. Simply put: Those that attain these components can succeed; those that don't, do not succeed. The Raj Manek Business Mentorship Program is high calibre, unique and, we believe, the best of its kind. Program participants can obtain access to suitable experienced mentors.

Alternately, the mentors we recommend to the program can exercise the desire to share their knowledge and wisdom. It is all wellmanaged by the small Raj Manek Mentorship Program team who have it down to a well-tuned science.

## COMPANY FEATURE SASKATOON Colostrum Company Ltd.

Deborah Haines, co-founder and Director, Saskatoon Colostrum Company Ltd. The Saskatoon Colostrum Co. Ltd. (SCCL) was formed in the mid 1990s as a spin-off from research conducted at The Western College of Veterinary Medicine at the U of S. Commercial products for supplementing newborn calves with colostrum (the "first milk" produced by mammals containing high levels of factors critical for immune protection) were just emerging and our research (supported by SK-ADF) showed that the available products were of poor quality. SCCL was launched with the support of the University in response to a market need, most critical for the Western Canadian beef

industry where newborns can perish if good quality colostrum is not immediately available. The company developed ways and means of collecting, processing and marketing excess dairy colostrum as high quality and effective colostrum products. Ag-West Bio was critical for the growth of SCCL into the successful commercial enterprise it is today by supporting the growth of the company to enter the US and Japanese markets. Today SCCL collects excess dairy colostrum from almost 2000 dairy farms all across Canada and markets into over 20 countries.

**44** Achieving profitability with even the best idea or product will be much harder than you'd think. **33** Deborah Haines

C Be in it for the long haul. Develop a path where you can persevere for as long as it takes to build your company.

Deborah Haines

## Commercialization CORPORATE INITIATIVES



2014 marked the first year of deployment of Ag-West Bio's current five year strategic plan. Within this plan Ag-West Bio has four key areas of focus: Leadership in strengthening the Saskatchewan bioeconomy; the commercialization of bioscience; supporting the Provincial goal of making Saskatchewan a global leader in biosciences by 2020; and providing services to members.

by Mike Cey, Director of Corporate Initiatives, Ag-West Bio

Learn to delegate and hire people to run certain aspects of your business that you aren't

David Gauthier AWB Board Member

good at. J

ff The cauldron of courteous conflict is far more constructive than the calm conceit of consensus. JJ John Cross Philom Bios Corporate initiative activities in 2013-14
We continue to take a lead position in developing industry initiatives around bio-based enhanced oil recovery (EOR) solutions for diluents and surfactants.

- We helped form and lead a "Biologicals Working Group" to establish high priority initiatives that will continue to leverage our unique capabilities within our world-class bioscience research and development cluster.
- At the BIO Pacific Rim Summit on Biotechnology in San Diego, we represented the cluster and made presentations on feedstock development for bio-industrial purposes in Saskatchewan.
- Here at home, we collaborated with Agriculture Canada and the Department of Foreign Affairs, Trade and Development to co-host workshops and receptions on aviation biojet fuel and green diesel for a commercial delegation from Europe.
- We hosted a Japanese commercial delegation with a focus on value added food ingredients.

We also hosted a delegation from the US Department of Energy that attended workshops and tours to research new transportation fuels sourced from second generation bio-industrial feedstocks. Ag-West Bio's external engagement continues as we lead and participate in a number of provincial and national bioscience committees, including Agriculture Canada's Bio Products Working Group and Regulatory Subcommittee, BIOTECanada's Industry and Ag Committee and the University of Saskatchewan's Feeds Innovation Institute's Industry Committee.

> Through engagements such as these, Ag-West Bio looks forward to continuing its role as Saskatchewan's bioeconomy catalyst.

# COMPANY FEATURE PHENOMENOME DISCOVERIES INC.

John Hyshka, Co-founder, Chief Financial Officer and Chief Operating Officer, Phenomenome Discoveries Inc. Phenomenome Discoveries Inc. (PDI) is a human health research company focused on the discovery and development of novel disease screening, treatment and health monitoring products. Using patented technology, PDI has identified novel serum diagnostic markers for over 12 human health disorders, paired with therapeutic strategies (patents pending) in oncology, neurodegenerative, and inflammatory diseases. In 2012 PDI launched its first product, COLOGIC®, a simple blood chemistry test for colorectal cancer. Key focus products currently

**K** You will always need more money than you think. So if you have people willing to invest on good terms, take as much as you can get. **9** 

John Hyshka

include blood tests for pancreatic cancer, ovarian cancer, Alzheimer's disease, and Multiple Sclerosis.

## Commercialization AG-WEST BIO: FUNDING BIOBUSINESS FOR 25 YEARS

% Entrepreneurship
is a sprintmarathon...you run
hard and fast for a
long time. 
%
Sanj Singh
AdeTherapeutics

Ag-West Bio can provide early stage capital and help secure matching funds for qualified earlystage or expanding companies. Ag-West financing takes the form of flexible and patient, repayable risk capital, and supports promising technologies at the early stages of development, often presenting too great a risk for traditional capital sources. It ranges from \$20,000 to \$300,000 and is targeted to initiatives where a clear pathway to

commercialization can be demonstrated. The

following companies are currently in our portfolio:

AdeTherapeutics Inc was founded in 2006 by a group of private investors to advance a discovery made by Dr. Adebola Obayan at the University of Saskatchewan (U of S) for a novel drug approach to preventing post-surgical adhesions (scar tissue). Sanj Singh, a co-founder with Dr. Obayan, currently serves as president and CEO of the company. The patents were assigned to the company in 2011 from the U of S. Today, thanks to Ag-West's 2011 investment of \$300,000, the company has moved its lead product into Phase 2 human trials and closer to commercialization.

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With headquarters in the heart of the Canadian Prairies in Saskatoon, SK, Bioriginal has been improving people's health, as well as the financial security and stability of producers, through omega ingredients since <u>1993. The founders envisioned involving producers, manufacturers and</u>



**ff** It is all about the customer. **JJ** *Joe Vidal*  marketers to produce an extensive range of omega ingredients. Bioriginal built long lasting relationships with growers in the region, and has collaborated with research organizations and universities to discover the wide range of health benefits offered by omegas.

Bioriginal was the first company in North America to develop omega 3-6-9 supplements – a blend of borage oil, flax

oil and fish oil. Bioriginal's innovative research team also began developing condition-specific omega products, a concept that was new to the health food industry at the time. The company continued to expand its omega ingredient portfolio, working closely with suppliers from around the world.

Today, with over 20 years of expertise in both plant and marine-based<br/>omegas, Bioriginal is a global leader in delivering complete omega<br/>solutions to the food and nutraceutical industries. Bioriginal Europe/AsiaJoe Vidal - President & CEO,<br/>Bioriginal Food & Science Corp.is located in Den Bommel, the Netherlands.



In 2002, **Agrisoma Biosciences** received \$100,000 for the development of a chromosome-based gene delivery technology in plant systems. The technology is being used to create a new generation of crops for bioenergy and food with enhanced performance, quality, and environmental benefits. Since the investment, Agrisoma has been recognized for commercializing Resonance<sup>™</sup> carinata, a non-food oilseed that is a sustainable source of high-quality oil for biofuel production. Saskatchewan-produced carinata was used to power the world's first 100% biojet flight in 2012, conducted in cooperation with NRC's Aerospace Division. The test flight demonstrated significant reduction in emissions.

**Bio-Id Diagnostics** develops technologies to identify microbes and infectious disease markers. It received \$100,000 in 2004 to develop DNAbased platform technologies for use in medical and agricultural sectors. **Bio-Id Diagnostics**' gene sequencing technology, MultiGen, along with a number of proprietary assets, has now put the company in a position to take advantage of this market.

**Biowave Aqua Solutions** manufactures and commercializes bio augmentation solutions. In 2013, Ag-West Bio invested \$300,000 to assist in the commercial scale up of bio augmentation products for wastewater management. Through a new platform technology process, Biowave efficiently isolates, identifies and characterizes microbial strains and removes organic solids from wastewater and surface water. Biowave's service teams are well trained and equipped in managing municipal, industrial, commercial, institutional and domestic wastewater bio augmentation treatment projects.

In 2012, **EcoLibra Systems** received \$150,000 to advance its waste water recovery technology and system processes. EcoLibra developed its sewage treatment process as an improved alternative to existing lagoon processes by focusing on the recovery and re-use of water. This technology, invented by Dr. Gurunathan Lakshman in Saskatoon, was originally designed for large hog production operations. EcoLibra is now commercializing its human waste water treatment and recovery systems in municipal, rural, and remote locations internationally.

MPT Mustard Products & Technologies converts the unique properties of mustard seed into fertilizers that support soil health and formulated biopesticides that control soil-borne pests and diseases. In 2010, MPT received \$300,000 for the development of a mustard seed based biopesticide. This technology was developed for use in professionally managed turf, ornamentals, and high-value fruit markets throughout North America.

 Open Mind Developments (OMD) received \$250,000 in 2013 to develop,

 market, and commercialize bio-composite products for retail and industrial

 markets and applications. OMD created and manufactures a unique, fully

 biodegradable and compostable,

 ecofriendly iPhone case made of

 biopolymer and flax fibre. OMD continues

biopolymer and flax fibre. OMD continues to develop new products that provide ecofriendly alternatives to conventional oil-based plastic products.

#### Phenomenome Discoveries received

\$100,000 in 2001 for advancing its metabolomic biomarker discovery concept and research tools for detecting human diseases before the illnesses are evident in the body. It has commercialized COLOGIC<sup>®</sup>: a simple blood test that screens for colorectal cancer, and has additional tests in its R&D pipeline.

Phenomenome has biomarker discovery programs in cancer and neurodegenerative disease, and has validated and filed patents on diagnostic biomarkers in multiple human health disorders.

In 2013, **Prairie Berries** received \$250,000 to advance value-added products and production methods, and high value food ingredients/ extracts for niche international markets and partnerships. Established in 2000, Prairie Berries is considered a leader in the Saskatchewan fruit industry, utilizing many partnerships to advance the research and commercial potential of the saskatoon berry industry.

25



numerous new products.



Northern Vigor Berries received \$150,000 in 2011 for the development

capitalize on the abundant growing market of seabuckthorn berries in North

and sale of value-added functional food products from seabuckthorn

berries. Established in 2007, Northern Vigor Berries is positioned to

America, and is a recognized leader in developing this market and



Love what you

do and wake up

every day with the

passion to make it

happen.

Sandra Purdy

Prairie Berries

**66** Take the high road -Good always comes back to you. JJ Jason Tratch Galex Group Corp.

**11** Listen to the skeptics and determine what it will take to turn them into supporters. **11** David Gauthier AWB Board Member

The idea never ends up being what you started with. It needs to be streamlined and cut back until it's a very concise story. 77

Martin Reaney Prairie Tide Chemicals

**G** Everything will take twice as long as you think it will. John Hyshka Phenomenome Discoveries Inc.

**G** Find the opportunity in the problem. **3**7 Kent Smith-Windsor Saskatoon Chamber of Commerce

Prairie Tide Chemicals (PTC) extracts individual cyclic peptides from flax seed oil. In 2012, PTC received \$300,000 for adding value to flax cyclic peptides for high value market applications. These peptides have shown exceptional promise as scaffolds for the synthesis of medically important drugs, along with other high value applications in several industries. PTC is positioned at the forefront of nutraceutical and bioactive product innovation.

Prevtec Microbia West Canada received \$150,000 in 2011 for the development of a combination oral swine vaccine to prevent post-weaning diarrhea caused by the F4 and F18 strains of E. coli. In Canada Prevtec is a leader in the development, manufacture and sale of vaccines, and aims to be a world leader in the commercialization of products providing an alternative to antibiotics.

In 2007, Quantum Genetix received \$300,000 for the commercialization validation of the Quantum Management Protocol, a system for determining optimal body fat and cattle slaughter dates by assessing the Quantum genotype, the obese gene that produces the hormone leptin in fat cells. The company was founded in 2003 through research at the University of Saskatchewan and continues to commercialize genomic technologies and applications to develop efficiencies in food animal production.

#### **Titan Clean Energy Project Corporation**

utilizes its bio-refinery concept to convert and recycle waste material into high value bioproducts for industrial and retail markets. In 2008, Titan received \$100,000 for the commercial development of biomass conversion to innovative valueadded products such as bio-mass briquettes, bio-char, activated carbon, and syngas.



## COMMUNICATIONS AND EVENTS informing the public

and keeping you connected

In April 2014, Ag-West Bio

hosted an information session on

Plant Breeders Rights - UPOV 91.

Presenters were Anthony Parker

of the Canadian Food Inspection

Agency and renowned plant

breeder Bryan Harvey.

### Stay informed:

In this age of the World Wide Web we can travel (virtually at least) to any place on earth, learn about people, animals, foods and technologies; imagination is the only limit. Information is available at the push of a button. The wonderful thing is anyone can post anything and add their voice to the Web. The problem is that anyone can post anything - true or not. Critical thinking skills are crucial in order to avoid being swept away by numerous sites that try to pass off 'pseudo-science' as the real thing.

Biotechnology (and specifically genetic modification or engineering) is a target for environmental groups like Greenpeace. One can only speculate about their motivation. With recent demand for labelling of foods produced through genetic modification (GM), opposition to the technology seems to be seeping into the public vernacular.

Arguments opposing labelling are many: GM is a process, not a product; labelling is normally reserved for safety issues (e.g. allergens); labelling would imply that these products pose a risk, even though countless studies have shown that they are safe.

In this part of the world, GM crops such as canola have reduced pesticide use, with higher production rates, reduced soil erosion and increased carbon capture thanks to the practice of zero-till. The technology has had a huge impact on our environment, on the lives of farmers and on the provincial economy.

In the developing world, GM technology can literally save lives and mean the difference between whether a farmer can feed his or her family or send his children to school. One example is Golden Rice, modified to contain high levels of beta-carotene in order to prevent vitamin A deficiency, which can lead to blindness and even death.



blogs, letters to editors, social media and outreach events, such as Agriculture in the City and National Biotechnology Week. We will continue this effort, working with our partners and drawing on the expertise available to inform the public that biotechnology is a safe and valuable tool, and that the scientific process can be trusted to expose poor quality research.

Ag-West Bio works to counter some of the anti-GMO rhetoric through

Like most companies, we rely heavily on the internet to disseminate information. We publish a quarterly newsletter, the Bio-Bulletin; we continue to publish a blog written by business and science experts on a wide range of topics; and a weekly update is emailed to our members and other subscribers with Ag-West Bio and member news and activities. We are working on the third edition of the Saskatchewan Bioscience Resource Guide, a print publication showcasing Saskatchewan's bioscience companies.

Canadian anti-spam legislation (CASL) came into effect July 1, 2014 causing some concern for businesses as they struggled to understand how the law affects them. Ag-West Bio is working to comply with the new law, gathering written 'opt-in' consent to send electronic messages. Information about CASL can be found on our website.

### Stay connected!

Creating networking opportunities is an important part of our mandate. Over the past 25 years, Ag-West Bio has organized many major conferences, including Plant Bio-Industrial Oils Workshops (seven); the Biological Futures conference series (three); the International Biofumigation and Biopesticides Workshop; Improving Human Health and Animal Health and Nutrition workshops, to name just a few.

The Agricultural Biotechnology International Conference (ABIC), created by Ag-West Bio, has been held 12 times around the globe since 1996. It will be hosted in Saskatoon for the fifth time this fall from October 5-8. In 2015 the conference will be held in Melbourne, Australia and moves to Fargo, ND in 2016. Visit www.abic.ca for more information.

Ag-West was one of the founding members of the Biotechnology Industry Organization (BIO), which hosts huge conferences around the world. Since 1997 we have been leading delegations to attend the annual BIO International Conference. We also regularly attend the BIO World Congress on Industrial Biotechnology.

This fiscal year we co-hosted a number of major conferences in Saskatoon, including the 2013 Canola Industry Meetings and Applying Genomics to Canola Improvement Workshop, the 2nd Canadian Wheat Symposium, and the Application of Synchrotron Imaging for Crop Improvement Workshop. We are currently working on the 14th International Rapeseed Congress, to be held July 5-9, 2015. We are also participating on a committee led by Tourism Saskatoon to help organize STEMFest 2015, a festival of science, technology, engineering and mathematics conferences next fall.

Smaller networking events, workshops, luncheons and seminars also bring the community together. In the past year alone we have welcomed three international delegations (Japan, the Netherlands and Australia) and more than a dozen workshops and seminars. We would like to thank Innovation Place for partnering with us on many of these events. More information can be found on our website:

#### www.agwest.sk.ca/events.html/archive

Ag-West Bio has led National Biotechnology Week activities in Saskatchewan since BIOTECanada created the week in 2004. This year, the week runs from September 26 to October 3 and promises to be as eventful as ever!

Sign up to receive Ag-West Bio weekly updates, follow us on Twitter @agwestbio and visit www.saskatchewanbiosciences.ca for information about research capacity in the province.





Top: MLAs joined the families of Manning Innovation Awards nominees for a networking reception to celebrate entrepreneurial spirit at the Legislature building in Regina. Wilf Keller is the Saskatchewan Chapter Chair of the Awards Foundation.

Bottom: Wilf Keller and Nick Diamond meet with representatives from Kinki-Bio, a Japanese bio-industry association.

#### Above: A 'Science Zone' was organized by Ag-West Bio at Ag in the City, an outreach event held in April at the Lawson Heights Mall. Ag in the City is a collaborative effort by Saskatchewan's bioscience research cluster to bring information about modern agriculture and bioscience to the public.



Top: Ag-West Bio organized a meeting and tour of Innovation Place for a delegation of canola seed companies from Australia in July. Andrew Bailey (centre) is the Executive Director of Client Relations, Innovation Place; to his left is Bryan Briggs, Syngenta Canada, who hosted the group.

Bottom: Ag-West Bio, Innovation Place and the UofS Industry Liaison Office co-hosted an information session on Western Economic Diversification Canada's Western Innovation Initiative (WINN) in November, 2013.



total number



# **25 YEARS OF BUILDING THE** BIOECONOM

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Ag-West Bio's Board of Directors ~ 1989 to 2014

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..2005-2007

.2007-2009

.2009-2012

..2012-2014

We would like to thank all of our members

for the ongoing support of our activities and

of Saskatchewan's

bioscience sector.

Ag-West Bio is working

to grow the bioeconomy in Saskatchewan and you are an important part of it.

To learn more about membership and to view

our members' list, please visit our website:

www.agwest.sk.ca/members.html

Financial statements are available upon request.

Photo sources: Agriculture and Agri-Food Canada, Ag-West Bio, Shutterstock, Canadian Light Source, Innovation Place

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