



supporting  
**innovation**

**A g - W e s t B i o 2 0 1 2 - 2 0 1 3 A n n u a l R e p o r t**





AWB will be spearheading the organization of **ABIC 2014 in Saskatoon (Oct 5-8, 2014)**

## president's message

**Saskatchewan's sustained economic growth has been a good news story in recent years, with the province's agricultural sector playing a key role.**

In its Plan for Growth tabled last fall, the Province has set ambitious goals for this sector, which include increasing crop production by 10M tonnes and increasing agri-food exports to \$15B by 2020.

The Plan for Growth envisions Saskatchewan as an International Leader in Bioscience by 2020. A number of important initiatives started in the past year will contribute to the achievement of this ambitious goal. The establishment of the Global Institute for Food Security (GIFS) was announced in December 2012 and since then a world-renowned pioneer in plant biotechnology, Roger Beachy has been recruited as the Founding Executive Director and CEO. Important consultations have been held with industry and government agencies and the development of key goals and objectives for GIFS are already in the advanced planning stages. A strategic initiative on wheat improvement, referred to as the Canadian Wheat Alliance, was announced in May 2013. This \$97M, five-year initiative involves a strategic partnership amongst Agriculture and

Agri-Food Canada, the Crop Development Centre at the University of Saskatchewan, the National Research Council of Canada (NRC), and the Province of Saskatchewan through its Agriculture Development Fund.

Ag-West Bio endeavors to play an important role in supporting the continued growth of Saskatchewan's strategically important agricultural and bioscience sectors. We have worked closely with the Saskatchewan Ministry of Agriculture in launching a five year strategic plan effective April 1, 2013 to March 31, 2018. We continue to provide networking capacity for the Saskatchewan bioscience community through the organization of conferences, seminars and workshops. I am pleased to note that Ag-West Bio has established a partnership agreement with the ABIC Foundation and will be spear-heading the organization of ABIC 2014 in Saskatoon (October 5 – 8, 2014).

As in previous years, we have led Saskatchewan delegates to major international conferences such as BIO 2013 in Chicago, the World Congress on Industrial Biotechnology in Montreal, and ABIC 2013 in Calgary.

Ag-West Bio remains committed to the commercialization of the biosciences as we

continue to support the growth of small and medium-sized enterprises. We have partnered with NRC Industrial Research Assistance Program (NRC-IRAP) to provide competitive intelligence service to our member companies. We continue to increase the number of members, as well as the quality of the service that we make available.

Ag-West Bio remains actively engaged in the coordination of strategic initiatives of economic relevance to Saskatchewan, including the use of industrial crops in bioproduct and biofuel development. We continue to look for new opportunities to support economic growth of Saskatchewan's bioindustries.

I wish to thank our dedicated staff for their tireless effort on behalf of our organization. Thanks go to our Directors who volunteer their time in guiding our corporation, and I wish to welcome three incoming Directors, Chantelle Donahue, Art Froehlich and Maurice Delage. We remain most grateful to the province for its continued generous support through the Ministry of Agriculture. ■

Wilf Keller

## letter from the chair



A Saskatchewan study led by Ag-West Bio culminated in the inaugural flight of a jet that ran on 100 per cent biojet fuel

**It's shaping up to be another productive year for Saskatchewan agriculture, especially in the emerging crop sector.**

As always, there have been challenges, such as new diseases and insect infestations, however, there are also new opportunities— from industrial agriculture to pharmaceutical applications, from advancement involving genomics to transformation technologies.

The global demand for new sustainable energy resources is on the rise. In response to the demand, the Saskatchewan industrial agriculture sector, aided by Ag-West Bio, initiated a study on biofuels derived from non-food sources. This culminated in the inaugural flight of a jet that ran on 100 per cent biojet fuel made from

*Brassica carinata* (carinata), evidence of a new frontier in biosciences in the agricultural sector. The global demand for food also contributes to a strong agricultural sector in



Saskatchewan, with new crops and products that fill niche markets, such as a new brand of cooking oil made from *Camelina sativa*. The Saskatchewan Ag-bioscience cluster uses innovative solutions for challenging production limitations that develop as industry-scale opportunities increase. An example of this is adding value to the biofuels and bioproducts sector by using byproducts for animal feeds.

Saskatchewan's Ag-bioscience sector is represented well by Ag-West Bio. As such, it is important to show support for the sector through continued membership with Ag-West Bio. The membership network has been working effectively: sharing ideas, considering government policies, and helping to shape the direction for Saskatchewan agriculture.

Ag-West Bio Inc. has served for 24 years in the capacity of encouraging and orchestrating the best minds to focus on meaningful issues related to progressing agriculture, using new scientific advances combined with new market opportunities. We look forward to working with the Ministry of Agriculture in Saskatchewan to continue to build a healthy, vibrant Ag-bioscience cluster. ■

Brent H. Zettl

**Vision:** To be Saskatchewan's catalyst for building Canada's most vibrant ag-bioeconomy.

**Mission Statement:** To enable the development and commercialization of innovation by linking research to industry for a diversified Saskatchewan economy.

**Mandate:** To provide leadership as a catalyst, to link existing capabilities and resources, in order to strengthen ag-bioeconomy industries in Saskatchewan.

### Ag-West Bio Staff

**President and CEO:** Wilf Keller

**Director of Corporate Initiatives:** Mike Cey

**Manager, Finance & Administration:** Boni Dorish

**Director of Commercialization:** Brad Bly

**Communications Director:** Jackie Robin

**Corporate Secretary and Executive Assistant to the President:** Lana Mollard

**Research Analyst:** Allison Sigstad

**Manager of Events:** Nicola Adams

**Commercialization Project Manager:** Monika Polewicz

**Events Assistant:** Brianna Hudson

**Administrative Assistant:** Christina Meads-McGowan

### Ag-West Bio Board of Directors

**Chair:** Brent Zettl – Prairie Plant Systems Inc.

**Vice Chair:** Peter Phillips – U of S Johnson Shoyama Graduate School of Public Policy

Abdul Jaiil – Saskatchewan Ministry of Agriculture

Brian Rosnagel – U of S Crop Development Centre

Jerome Konecni – Innovation Saskatchewan

Steven Fabijanski – Agrisoma Biosciences Inc.

David Gauthier – Business Investment and Technology Commercialization Consulting

Art Froehlich – Agriview Inc.

Maurice Delage – Delage Farms

Chantelle Donahue – Cargill

# industry overview Saskatchewan Biosciences

## Optimism and Evolution

**Optimism in Saskatchewan's agri-food industry is high.** We have infrastructure to support investment, specialized talent is readily available, and demand for Saskatchewan's agricultural products is growing. The future is bright, as long as we can meet two key challenges: First, can we effectively communicate to the public and policy makers this sense of growth and optimism? Second, can we evolve our structures and processes fast enough to meet our potential?

## Growing Infrastructure

It is common knowledge within the industry that Saskatchewan is an excellent place to do business in biosciences. Wilf Keller, president and CEO of Ag-West Bio, says Saskatchewan is a rapidly growing economic powerhouse. "The research cluster has existing infrastructure and expertise. Including both public and private sectors, there are probably 1,500 individuals working in the agricultural and bioscience R&D community; that is an excellent source of specialized labour and talent." Saskatchewan's agricultural history also ensures that it is the ideal location to test research in the field.

The research cluster includes the University of Saskatchewan (U of S), putting out experienced

plans for a **cyclotron** are currently underway in Saskatoon.



**Above:** Scientists at VIDO-InterVac safely conduct research into diseases like tuberculosis, hepatitis C, HIV/Aids, avian influenza and prion diseases. The world-class containment level 3 facility on the U of S campus achieved certification this spring.

grads; the U of S Crop Development Centre, Agriculture Canada and the National Research Council doing important research on wheat and industrial applications for oilseeds, the

Saskatchewan Research Council and VIDO-InterVac ramping up biomanufacturing for vaccines; and institutions such as Canadian Light Source (CLS), POS Bio-Sciences, and Innovation Place's Bio Processing Centre, available for research and product testing.

Ag-West Bio is doing its part to attract international attention to the agbio cluster with international trade missions and plans to host several major events in the next two years. Ag-West is organizing the Agricultural Biotechnology International Conference (ABIC) in Saskatoon in 2014 and, along with the Canola Council of Canada, is organizing the International Rapeseed (Canola) Congress in Saskatoon in July, 2015.

More infrastructure, with bioscience research potential, has just come online, with more to come in the future. The Royal University Hospital opened its new PET-CT scanner this year, which, while having obvious benefits to the health industry, may also have potential for the study of plants and plant tissues. In addition, plans for a cyclotron are currently underway at the Sylvia Fedoruk Centre for Nuclear Innovation. To educate members on research potential for plant research, the CLS and Ag-West Bio are planning a workshop on plant imaging in June, 2014.

There is much growth potential in the health-area of biosciences. John Hyshka, Chief Financial

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**Above:** A lab technician at POS Bio-Sciences analyzes aqueous based bioactives for use in products such as nutraceuticals and health supplements.





“We need to take a **systems-based approach to answer most questions**, including those in the food and agriculture sector.”

Roger Beachy  
Global Institute for Food Security

and Operating Officer of Phenomenome Discoveries, points out that while the university is well-known for turning out agriculture-focused grads, there are fewer chemistry and health sciences grads. Regulatory support of health-area bioscience business is extremely positive, says Hyshka, so in spite of a lack of PhDs in chemistry and medical research, PDI is on its way to meeting the goal of building a world-leading life sciences company in Saskatoon.

### Communication is Key

Much less tangible but as crucial as bricks and mortar is public and policy support for biosciences in Saskatchewan. Lyndon Carlson, Farm Credit Canada’s Senior Vice-President, Marketing, explains that their *Agriculture More than Ever* movement was a response to a disconnect between the sense of optimism within the farming industry at the producer level, and attitudes toward agriculture in urban centres.

Alanna Koch, Saskatchewan’s Deputy Minister of Agriculture, agrees that communications is crucial. “People not understanding agriculture and the well-educated people behind the industry has the potential to affect producers’ bottom line and their right to operate, or it can result in closed borders,” she says. “It can lead to producers not having access to the resources, expertise and people, technology, products and equipment they need to do their jobs.”

The Ministry of Agriculture’s *Agriculture Awareness Initiative* program under Growing Forward 2 was established to support information, training and education efforts, including the recruitment and training of industry spokespersons. This program, in parallel with *Agriculture More than Ever’s* encouragement of “advocates” who speak to their passion for the industry and optimism for the future, aims to



Above: A laboratory technician at POS Bio-Sciences analyzes oil to determine its high value components

help improve the public perception of agriculture.

At the industry level, there is another aspect of communications, both domestically and internationally, to address attitudes and policies regarding genetically modified organisms (GMOs). CropLife Canada is working on all levels, from addressing the safety and regulations of GMOs for consumers and facilitating industry outreach to the public, to taking the industry lead on a national Low Level Presence policy for GMOs and working to harmonize maximum residue

limits on minor use crops.

Janice Tranberg, CropLife Vice President, Western Canada, says, “Representation of biotech has been more balanced in the media in the last three years, but we have more work to do to convince consumers to rely on the experts in this field.” Lyndon Carlson adds: “We’re too late if we’re always defending our industry. We need to get out front and explain the science first.”

### Optimism = Investment

Changing the public face of agriculture is one of many shifts on the horizon for the industry. Funding structures are evolving, with more focus

on public-private partnerships. In fact, says Keller, “We also see movement to a P4 [public-private-producer partnerships] approach.”

The Canadian Wheat Alliance is a partnership involving Agriculture and Agri-Food Canada, the National Research Council of Canada, the U of S Crop Development Centre and the Province of Saskatchewan. The partners are devoting \$97 million over the next five years to the project, which will improve pest and drought resistance, heat, frost and flood tolerance in wheat.

The most significant example of partnering is the establishment of the Global Institute for Food Security (GIFS) in Saskatoon, last year only a dream—now, a reality. GIFS was created as a partnership among the Saskatchewan Government through the Ministry of Agriculture, the University of Saskatchewan, and Saskatchewan’s PotashCorp.

Roger Beachy, Founding Executive Director of GIFS, notes that with more industry funding, the traditional approach to research will evolve. “The old way of doing research involved information-rich silos,” says Beachy. “Now we need to take a systems-based approach to answer most questions, including those in the food and agriculture sector. That could mean involving

scientists and technologists in disciplines that include breeding, processing, packaging, genetics and microbiology, economics and policy making on the same project. We need to put more effort on ‘team science,’ which could mean restructuring the system of rewards for researchers. It will be a challenge for both the science and administrative communities.”

Over the last five years, the Government of Saskatchewan has more than doubled its investments in agricultural research. The Ministry of Agriculture’s Agriculture Development Fund has established strong partnerships to co-fund projects with organizations such as the Saskatchewan Pulse Growers, Saskatchewan Canola Development Commission and Western Grains Research Foundation. These new ways of funding research to use resources more effectively, support the sustainable growth of the agriculture sector at home and will help meet the escalating global demand for food.

There is more private investment to come, with recent commitments from Monsanto to invest \$100 million over the next decade into corn and soybean research on the Canadian Prairies.

Genomics research is also evolving. Keller explains, “In the first 10 years of genomics,



Above: Eric Johnson, scientist at AAFC’s Scott Research Farm, inspects a test plot of Ethiopian Mustard (*Brassica carinata*).

much of the focus was on genome sequencing. Now sequencing is becoming more and more affordable, and we are using genomics as one of the many tools in our toolkit.” The new generation of genomics research funding has also come of age with Genome Canada’s Genomics Applications Program (GAPP), which intends to provide funding for applications using genomics technology. Genome Prairie will be coordinating this initiative in Saskatchewan and Manitoba. ■

# Commercialization success Creativity accelerates commercialization



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

**Like our member companies, Ag-West Bio must maximize productivity under resource constraints.**

We take pride in finding creative ways to achieve ambitious goals, within our budget. The challenge keeps us fresh and inquisitive, motivating us to continually push the envelope through leveraging and partnering. We are proud to respond effectively to issues and opportunities relayed to us by our membership. Finding solutions is not possible without considerable input from industry stakeholders – and most importantly, from the member companies we try to assist. Looking back at the past year of commercialization activities, a theme jumps out: “Using creative methods to accelerate commercialization.”

#### Some of these methods are outlined below.

- Accelerating commercialization with strategic information: Using one-on-one membership discussions, along with a multi-stakeholder commissioned examination, we determined gaps affecting the establishment and growth of bioscience

companies. The conclusion: Companies would benefit from a strategic information service, and this service would improve our existing technology commercialization investment fund. The next question was how to fill this gap within our limited resources. Through NRC-IRAP assistance, we devised a unique program: Bioscience companies gain subscription access to state-of-the-art, on-line information databases through a specially-constructed AWB subscription. It doesn't stop there: we

also provide the companies with training on how to use the databases and other sources to find information, and then use it effectively. To date, this program has benefited 10 companies. Our creative effort allowed these companies to attain this valuable (and expensive) information with limited resources. Ag-West Bio's new project manager, Monika Polewicz (hired by leveraging NRC-IRAP resources), is leading this project.

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**“Research is the transformation of money into knowledge. Innovation is the transformation of knowledge into money.”**

*Dr. Geoffrey Nicholson,  
former VP of 3M Corporation,  
and developer of “Post-it” Notes*





- **Expanding advisory input:** We understand how important it is for early-stage companies to attain qualified advisory input. With this in mind, a few years ago we partnered with the Raj Manek Mentorship Foundation. Companies benefit from Manek Foundation seminars, and we work with the Foundation to link business mentors to protégés. However, every year several companies identify the need for very intensive mentoring designed to address a critical, one-time hurdle in their growth.

This is not something we take lightly: We know that a significant roadblock at a critical early stage can break a company. So this year we partnered with the CETAC-West Entrepreneur to CEO Workshop. Two companies in our investment portfolio attained critical mentoring through this program, allowing them to overcome specific hurdles and reach significant commercialization milestones.

- **Linking research to business:** Ag-West Bio works as a conduit, keeping abreast of

resources and programs, and matching these to gaps identified by us and our members. At the heart of all our efforts is linking (and converting) bio research to business, so when we identified several established companies in need of specific research expertise to advance their business, we set out to devise a creative way to assist. Working with SIAST's Office of Applied Research and Innovation, U of S Industry Liaison Office, University of Regina, Regina Regional Opportunities Commission, BioAccess, and Innovation Saskatchewan, we devised an Industry Connector Event to link researchers to businesses. At the event, 12 bioscience companies were introduced to scientists specifically engaged in the research area identified by each company. In one evening (after a tremendous amount of preparatory work), participants received customized applied research expertise to enhance their business productivity. They also received information on funding programs aimed at facilitating ongoing collaboration of research to business, along with important links to commercialization necessary for accelerating research. We wish to thank NSERC for guidance, funding and

valuable programs which made this initiative successful.

- **Stretching investment dollars:** Last year, AWB signed investment agreements with four life science companies using our technology commercialization fund. These repayable agreements, totalling \$1,050,000, provide flexible, patient, risk capital tailored to each company. We know, however, that AWB investment alone is not enough to achieve commercialization. With diligent effort by the companies, Ag-West Bio helped to creatively leverage the investment by a multiple of four. Sources ranged from private shareholder loans, to the AAFC Growing Forward program, and many others. The AWB Commercialization Fund was used as designed: a leveraging tool to maximize the creative capacity for companies to achieve the capital they need.

**Ag-West Bio** will continue to take advantage of this momentum, find new ways to accelerate industry commercialization—and just as important—ways to maximize the benefits of our existing suite of activities. As always, I encourage our members to contact us to discuss their hurdles and ideas. It is often these discussions that lead to the creative solutions that we—and our companies—are known for. ■

## Developing Industries



by Mike Cey, Director of Corporate Initiatives

**This year marked the development of our five year strategic plan for the period from 2013-2018.**

**In our plan we outlined four key areas of focus:**

- Leadership in strengthening the Saskatchewan bioeconomy;
- The commercialization of bioscience;
- Supporting the Provincial government's goal to make Saskatchewan a global leader in biosciences by 2020; and
- Providing services to members

Within each of these areas a number of initiatives and objectives have been set. As part of the development of the plan, a Networking and Economic Impact Assessment was conducted by the University of Saskatchewan, which indicated that the economic impact of Ag-West Bio from 2007-2012 is estimated to be \$340 million. In the same time period, an estimated 1,282 person years of R&D employment resulted from Commercialization Fund investments. A survey of existing members was conducted to analyze our performance and to seek input to determine how we can provide greater value.

We had the opportunity to represent the cluster and make presentations on industrial oilseed developments at international biotechnology conferences, including the Pacific Rim Summit on Biotechnology in Vancouver and the Canadian Renewable Fuels Summit in Ottawa. Here at home, research exchange visits took place with Cargill, Mitsubishi and Washington State University.

Membership has increased over the past year and our engagement with members continues to grow as we respond to the new challenges and opportunities our members face.

Ag-West Bio has taken a lead position in developing industry initiatives around biobased enhanced oil recovery (EOR) solutions, along with feed and food value-added opportunities. In 2013 we also had the opportunity to host a Dutch intern, Floor Osseweijer, who has been focussing on developing Canadian-European collaboration opportunities around biojet fuel initiatives.

We continue to take a leadership role in the development of new bioproducts and biofuels within Saskatchewan. Momentum is growing towards commercialization for carinata and camelina, two crops with great

promise as bioindustrial feedstock. To increase that momentum, we work with the cluster, hosting tours, workshops, meetings and networking events. An example is our Plant Bio-Industrial Oils workshop (P BIO). This international event attracts leading-edge companies and researchers, connects them to key Saskatchewan players, and encourages them to explore opportunities within the cluster. In March 2013, we hosted the 7th P BIO workshop in Saskatoon.

Ag-West Bio's external engagement continues through participation and leadership on a number of provincial and national bioscience committees, including Agriculture Canada's Bio Products Working Group, BioteCanada's Industry and Ag Committee, the University of Saskatchewan Feeds Innovation Institute's Industry Committee and Genome Prairie's Prairie Gold Steering Committee. ■



# company profile Prairie Tide Chemicals



PTC president and CEO Martin Reaney (on right) and Kelly Shone (Bioriginal Marketing Director), with (from left) U of S College of AgBio graduate student Da Wang and PTC Senior Research Officer Youn Young Shim, at the Innovation Place Bio Processing Centre.

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

## Going with the flow

Translating a scientific idea into a marketable product is not always a straightforward path. Martin Reaney, President and CEO of Prairie Tide Chemicals (PTC), can attest to that.

His original idea involved the large-scale production and sale of orbitides (a special class of peptides) that can be extracted from flax seeds. Although there was no market for orbitides at the time, Reaney knew from his experience in chemistry that they have potential value as components of nutraceuticals, pharmaceuticals and cosmetics. "It was hard for others to see the commercial value the way I saw it," says Reaney. "What I needed was business support and a strong business case."

Reaney had research questions related to industrial production that were outside of academic interest, so he decided to start a

business. He had some great ideas, but translating them into business applications was a challenge. "There are ideas, and then there are ideas you can cash. It's very difficult to sort through those ideas. Reality often crashes into your ivory tower."

As Reaney was developing his business case, a well-established Saskatoon company that was interested in making sweet flax oil worked with him. The oxidation of peptides causes flax oil to have a bitter taste; if the peptides are removed, the oil stays sweet. Through a partnership with Joe Vidal at Bioriginal, Reaney found a market for the by-product of his peptide production—even before he had a solid market for the product he hoped would be the foundation of his business.

With start-up funding from Ag-West Bio, a partnership with Bioriginal, important guidance from Lisette Mascarenhas at Springboard West Innovations regarding setting up business processes, an unofficial board of directors, and intellectual property (IP) support from the University of Saskatchewan's Industry Liaison Office, PTC was established. "If I were to list all the partners and mentors, it would be a very long list," Reaney muses. "But we could never have started the company without funding from Ag-West Bio."

Brad Bly, Director of Commercialization at Ag-West Bio, says Saskatchewan's academic



community recognizes Reaney as an award-winning researcher and scholar, but it was his entrepreneurial attributes that led to the funding. An example is his track record in using Ag-West's international workshops to meet and develop relationships with potential commercial partners. "Dr. Reaney thinks globally in executing PTC's revenue strategy, and it is his past accomplishments that give him the networks, and credibility, to do so."

Reaney cites a long list of benefits to starting up his company in Saskatchewan. With such a large research cluster, "there is a large talent pool, and no shortage of good people to hire." The business is also in close proximity to the required resources: large quantities of affordable

flax. "The tools for addressing technical challenges are here, such as the Canadian Light Source, the Innovation Place Bio Processing Centre and the College of Agriculture and Bioresources Bio Processing Pilot Plant," he adds. "The infrastructure for manufacturing already exists—you don't have to build a factory, you can rent one!"

There are a couple drawbacks, however, including challenges in finding collaborators and investors interested in the business, and Reaney says Saskatoon's lack of direct flights is also a challenge. Since the product will be marketed and sold globally, access to efficient airline infrastructure is a preference.

As the business gains momentum and interest grows in PTC's peptides, Reaney can begin to reflect on what he's learned during the process. First and foremost is the shift from the research mind to the CEO mind: "A CEO should talk to other CEOs. As a researcher you can get bogged down in the technical and not look at the big picture. You can end up spinning your wheels looking at the small details, and miss out on talking to the decision makers."

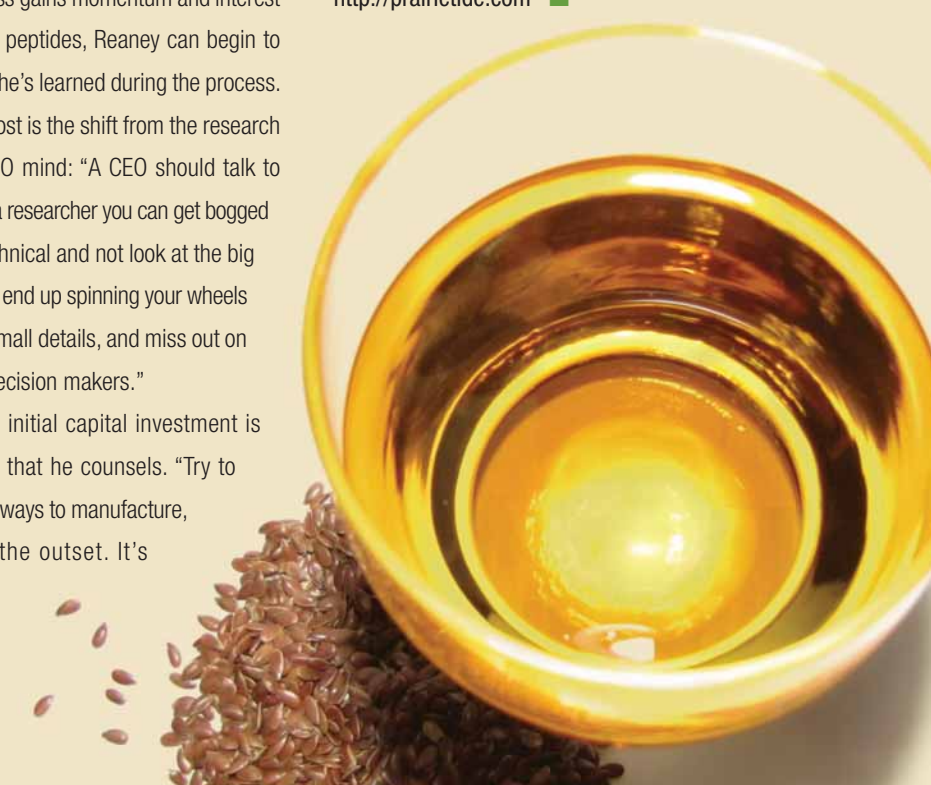
Limiting your initial capital investment is another choice that he counsels. "Try to find low-capital ways to manufacture, especially at the outset. It's

difficult to match novel product production to the appropriate scale when you're just starting out. Wait until you have a sense of that scale before you build."

And as always, it's a good idea to ask for help: "It's advisable to get someone experienced in manufacturing early on. It's hard to gain that knowledge except through experience."

One never knows where a venture will take you. Flax oil research, for example, was not part of the original business plan, but it is now a large portion of Prairie Tide's current work. By going with the flow, Reaney's dream of manufacturing and distributing high-value peptides around the world will soon be realized.

<http://prairietide.com> ■





# company profile Okanagan Specialty Fruits

Neal and Louisa Carter in their apple orchard near Summerland, BC.

## Science interacts with social media

**The science behind Okanagan Specialty Fruit's Arctic® apple—so named because the cut apples stay as white as the unspoiled Arctic snow—is fairly straightforward:** the gene responsible for enzymatic browning is silenced, suppressing the chemical reaction between the polyphenol oxidase and phenolics that occurs when the apple's cell walls are ruptured. Less straightforward is navigating a path through federal deregulation, consumer misinformation and social media when you've got a genetically-modified product to successfully market.

Neal Carter, founder of OSF, says, "Sure, the science has advanced rapidly and there are all sorts of ways to do things faster and better today but at the end of the day you have to realize that the science is really the easiest part. It's the rest of it; the pre-commercialization, the intellectual property, the licensing, all of that, that's the complicated part."

Research for product development started in 1996, and by 2003 the first lines of Arctic apples—Arctic Granny and Arctic Golden—were in field trials. Carter says field data was crucial: "I'm an apple grower myself and I wanted to make sure these trees did what we said they would do. We were never in a race to get them

to the market. We wanted to make sure that when we did that, we had a high level of confidence around the product."

OSF is anticipating a green light from both US and Canadian federal agencies in late 2013. Once the apples are deregulated, planting will take place in spring of 2014. But Carter knows it will take a concerted effort to overcome public



OSF wants to bring other non-browning varieties, like Fuji and Gala, forward for deregulation

perception of what some anti-GM activists disparagingly call 'frankenfood.' To combat misinformation, Carter says OSF has been using social media to tell the real story; "Biotech foods have an enviable track record... there's never been a single health issue that can be tied back to any type of biotech crop."

Carter says anti-GM activists want the Food and Drug Administration (FDA) in the US to force developers of biotech crops to label genetically-modified food. The FDA is resisting because the crops have been deemed as safe as the conventional crops they're compared to. "Many consumers recognize that apple browning is an issue that causes food waste, higher retail costs and lower consumption." Carter also says the big Ag companies don't spend enough time educating the public about biotech crops and feels that once consumers have accurate, science-based information biotechnology will be met with greater acceptance.

Carter says cross-pollination between Arctic apples and apples grown in other blocks is a non-issue, since bees, the main pollinators, don't travel far from their own hives. He says a 30-foot wide tractor path between blocks is enough to discourage insect pollination. He adds that even if a wind-blown bee pollinates another block with Arctic apple DNA, it doesn't make the resulting apple transgenic or non-browning because the apple itself is maternal tissue and only five per cent of the seed by weight has paternal tissue from the pollen. As for the seed itself, "if an apple falls on the ground, the seed will rot, not grow."

Along with educating consumers, Carter advises young companies exploring biotechnology to

have patience: "It's tough, very tough. You have to be really focused, you have to really know the industry you're going to be involved in... and you have to know where your product will fit in that business, how it's going to come to market and what the value proposition associated with that product is."

Once Arctic Golden and Granny are on the market, OSF wants to bring other non-browning varieties, like Fuji and Gala, forward for deregulation and plans to ramp up research and development to engineer apples resistant to storage scald, fire blight and apple scab; these apples would also have the non-browning trait.

While the company is headquartered in Summerland, BC, the OSF research lab is located in Saskatoon at the National Research Council Canada and Saskatchewan's bioscience cluster has helped OSF enormously. Carter says, "They have people who are specialists in their field and specialized equipment that we can't afford—but that we can buy time on and get more work done. We're going to learn a lot and that's a real advantage that allows us to advance our science and our regulatory data packages faster."

Brad Bly, Director of Commercialization at Ag-West Bio, says OSF stands out for its exceptional science and expertise, and diligent, positive work ethic. He notes the commercialization of Arctic Apples is timely, considering the heightened media focus on population growth and food security. "Every year tons of nutritious apples are wasted as a result of bruising. Not only does this represent a waste of wanted food, but a cost to the industry which is passed on to growers and consumers. Okanagan Specialty Fruits has developed a technology to address this: It's real, it's delicious, and it doesn't turn brown."

Carter says OSF has embraced social media to educate consumers. "We invite people to like us on Facebook, follow us on Twitter or visit our consumer website to recognize how transparent we are in terms of answering pretty well every question we get."

[www.okspecialtyfruits.com](http://www.okspecialtyfruits.com)





# events & communications

## Supporting Innovation



High school and SIAST students joined forces during the 2nd Amazing Biotech Race, which took place at Innovation Place during National Biotech Week.

**Biotechnology has had a dramatic impact on our world.** Vaccines and antibiotics, reliable health diagnostic tools, hardier agricultural crops, and cleaner industrial products have all become a reality thanks to this important tool.

It is interesting that in privileged parts of the world—where a major concern is that people are suffering from obesity—there is a backlash against biotechnology. This has come to the fore with the demand for labelling of products that contain genetically modified foods. It is a complex issue that involves economics and politics. Although these technologies provide benefits that far outweigh any risks, and have been pronounced safe by scientists around the world, certain groups are perpetuating fear of the technology.

As Saskatchewan's bioscience industry association, Ag-West Bio has the challenge of keeping track of the conversation that is taking place in the mainstream and social media around biotechnology, and specifically, genetic modification. It's obvious from many comments posted online that the fear is due to ignorance caused by misinformation. Whether the misinformation is intentional or also due to ignorance is up for debate. The danger, if this public concern isn't addressed, is that policy could be affected and we could lose access to

this valuable technology. Sadly, this has already had an impact in developing countries where hungry people have been deprived of high-quality food because it is deemed 'poison' by those in the position of authority.

The important GM debate was just one of the many topics addressed by Ag-West Bio communications this year. The communications centre for Ag-West Bio is our website, where we



**Top:** Attendees at the Plant Bio-Industrial Oils Workshop listen to a presentation.

**Bottom:** Students learn how to extract DNA from kiwi fruit during Biotech Blast at the U of S College of Agriculture and Bioresources in November, 2012.

regularly post blogs written by local science, business and policy experts, designed to encourage critical thinking and discussion. Topics vary widely, with posts on innovation, entrepreneurship, policy, regulations, marketing and social media, as well as on specific technologies. We sincerely appreciate the time and effort that our guest bloggers put in to these editorials, which add significant value to our communications efforts. A number of the blogs were republished on other sites and in the western Canadian ag newspaper, the Western Producer. The quarterly Bio-Bulletin, a collection of articles about research achievements, company successes and events within our bioscience cluster, is viewed around the world. Articles are written by Ag-West Bio staff or submitted by our members. Our Twitter community grows daily (follow @agwestbio). In May, we joined the March Against Monsanto Twitter conversation, which increased our following significantly. We also responded (and encouraged others to respond) to inaccurate editorials published by local media.

Communications to increase agricultural awareness has been the topic of discussion lately. The Saskatchewan Ministry of Agriculture's Ag Awareness program is an important step to address this. Ag-West staff attended the Ministry's Agriculture Awareness Summit in Regina. In

Saskatoon, Wilf Keller spoke at the 2nd Annual Food Summit hosted by the University of Saskatchewan, and at Canada's Public Policy Forum Breadbasket 2.0. These events explored various aspects of food security, from production capacity, to waste, to urban gardening.

### Building networks, encouraging collaboration

The AWB events team had an extremely busy year, hosting our own events and helping to organize member events, such as the Canola Industry Meeting which is held in December each year.

We hosted the 7th Plant Bio-Industrial Oils Workshop in March 2013, working with a committee drawn from the community to bring international speakers and delegates to Saskatoon. The event was a success, with 120 attendees and topics ranging from biojet fuel to the potential of unusual crops such as pennycress, to tips on navigating regulations and more.

- We led delegations to three major Biotech Industry Organization (BIO) conferences:
- At the Pacific Rim Summit on Industrial Biotechnology and Bioenergy, we hosted a dinner with some of the leaders in the air-line industry to discuss the potential of biojet fuel.

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**“Producing food for 6.2 billion people, adding a population of 80 million more a year, is not simple.**

**We better develop an ever improved science and technology, including the new biotechnology, to produce the food that's needed for the world today.”**

Norman Borlaug,  
Father of the Green Revolution,  
from his 1970 Nobel Lecture



# Forum

- At BIO 2013 in Chicago, we co-hosted a reception with Life Sciences Association of Manitoba (LSAM) at The Quay. Jerome Konecsni, CEO of Innovation Saskatchewan, and former Manitoba premier, Ambassador Gary Doer, addressed the attendees. The venue was full and the atmosphere was festive. We plan to collaborate with LSAM again in 2014.

- World Congress on Industrial Biotechnology in Montreal gave us the opportunity to showcase an Ag-West Bio member company, Agrisoma Biosciences, at a workshop called Building the Aviation Biofuels Supply Chain Network. The event was a great success, with more than 65 attendees. Jim Lane, editor of Biofuels Digest, moderated the panel discussion.

Closer to home, Ag-West collaborated with Innovation Place on a number of networking events, including #AgChat at Boffins Club, which welcomed Renterria and Farm at Hand to the research park. We also hosted Low Level Presence of GMOs, a seminar with Janice Tranberg (CropLife Canada), and helped Peter Phillips (U of S) launch his latest book "Governing Transformative Technological Innovation: Who's in charge?"

Knowing how to search for research information

is invaluable for companies. Monika Polewicz, our Commercialization Project Manager, led a workshop in the spring called Google Tips & Tricks, which showed participants how to harness this powerful search engine to sort through the overwhelming volume of online data.

## Committees and partnerships

Ag-West Bio joined the organizing committee for Ag in the City, a public ag-awareness event spearheaded by Agriculture & Agri-Food Canada, held at The Mall at Lawson Heights in April. Families took part in hands-on activities, planting seeds, crushing canola, cheering on award winning chefs in a cooking contest, and wandering through a trade show. "Wow, that's from Saskatchewan," featured AWB members Martin Reaney and Mark Pickard. The Ag-West Bio booth displayed bioproduct samples from Saskatchewan companies.

We participated on the planning committee for the Sanofi BioGeneius Challenge Canada Saskatoon regional competition, which showcases some of the country's brightest young scientific minds. We have partnered with Ag More than Ever – a program designed by Farm Credit Canada to increase public understanding of modern agriculture and help dispel some of the myths, and will use their marketing resources



**Top:**In the Canada Café at BIO 2013 in Chicago, from left to right: Danya Kordan (Innovation Saskatchewan) Wilf Keller (Ag-West Bio), Minister Gary Goodyear, Paul Hodgson (VIDO-InterVac).

**Middle:**A workshop hosted by Ag-West Bio during World Congress in Montreal focused on the success of member company Agrisoma Biosciences.

**Bottom:**Saskatchewan Manning Innovation Awards nominee reception at the SK Legislative Building. From left: Innovation Saskatchewan CEO Jerome Konecsni; nominee Darrin Craig (DynaIndustrial); SK Minister of Agriculture Lyle Stewart; nominees Marnee Brick and Greg Sutton (TinyEye Therapy Solutions); Nick Meiring (Saskatoon Colostrum Company) attended on behalf of nominee Deborah Haines.

to help get the message out. We also forged a partnership this year with BioTalent Canada, which extends valuable human resource services to our membership (for example, our members are eligible for discounted listings on The PetriDish™ Job Board).

This year, Wilf Keller was appointed Chair of the Saskatchewan Chapter of the Ernest C. Manning Awards Foundation, and helped select the Saskatchewan nominees. To honour the nominees, Ag-West Bio hosted a networking reception at the Saskatchewan Legislative Building in Regina in May.

## ...and the work continues:

We are gearing up once again to lead delegations to the BIO conferences in 2014, and preparations are ongoing as we host or organize numerous local events, including National Biotech Week, the Canola Meetings, the Canadian Light Source Plant Imaging Workshop and ABIC 2014, various networking events and incoming delegations. Check our online events calendar for updates.



Ag-West Bio coordinates National Biotech Week activities in Saskatchewan. To learn more about 2014 events, visit

<http://www.agwest.sk.ca/>

[kaizen/ NBW2013/NBW2013.htm](http://www.agwest.sk.ca/kaizen/NBW2013/NBW2013.htm) ■

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## Ag-West Bio members

- AdeTherapeutics Inc.
- AdFarm
- Advance-Tek Consulting Inc.
- Agriculture and Agri-Food Canada
- Agriculture in the Classroom
- Agrisoma Biosciences Inc.
- API Labs Inc.
- AstraZeneca Canada
- Barb Stefanyshyn-Cote
- Bayer CropScience Inc.
- Becker Underwood
- Bill Brown
- BioEnterprise Corporation
- BioExx Specialty Proteins Ltd.
- Biolin Research Inc.
- Bioriginal Food & Sciences Corp.
- Bioresource Business Policy and Economics Dept. - U of S
- BIOTECCanada
- Biowave Aqua Solutions
- Brian Rosznagel
- The Canadian Association of Farm Advisors
- Canadian International Grains Institute (CIGI)
- Canadian Light Source
- Canadian Seed Trade Association
- CanMar Grain Products Ltd.
- College of Agriculture and Bioresources - U of S
- Contango Strategies
- Crop Development Centre - U of S
- Dow AgroSciences
- EcoLibra Systems Inc.
- Edwards School of Business - U of S
- Emerald Seed Products Ltd.
- Farm Credit Canada
- Farmers of North America
- Feeds Innovation Institute - U of S
- Foragen Technologies Management Inc.
- Frontier Agri-Sciences Inc.
- G & D Martin Family Farms
- Genome Prairie
- GlaxoSmithKline
- Gowlings
- Greater Saskatoon Chamber of Commerce
- Global Institute for Food Security - U of S
- Haider Abbas

- HeadsUp Plant Protectants Inc.
- Industry Liaison Office - U of S
- InfraReady Products (1998) Ltd
- Innovation Place
- Innovation Saskatchewan
- International Bioresources Research Group
- Laberge Biotech
- Life Science Association of Manitoba
- Linnaeus Plant Sciences Inc.
- Metabolix Oilseed Inc.
- Milligan Bio-Fuels Inc.
- MPT Mustard Products Technologies Inc.
- Mustard Capital Inc.
- National Research Council
- Nipawin Biomass Ethanol
- New Generation Co-operative Ltd.
- Northern Vigor Berries Inc.
- Northlands
- Novartis Pharmaceuticals Canada Inc.
- Novozymes BioAg Limited
- Okanagan Specialty Fruits Inc.
- Ontario BioAuto Council
- Open Mind Developments Corporation
- Pan-Provincial Vaccine Enterprise Inc. (PREVENT)
- Paterson Grain
- Pete Desai
- Peter W.B. Phillips
- Pfizer Canada Inc.
- Phenomenome Discoveries Inc.
- POS Bio-Sciences
- Prairie Agriculture Machinery Institute
- Prairie Berries Inc.
- Prairie Fire Growth Venture Inc.
- Prairie Plant Systems Inc.
- Prairie Tide Chemicals Inc.
- Prevtec Microbia West Canada Inc.
- PRTox Consulting Inc.
- Quantum Genetix Canada Inc.
- Quantum Mechanical Technology Inc.
- Rx&D
- Saskatchewan Canola Development Commission
- Saskatchewan Flax Development Commission
- Saskatchewan Food Industry Development Centre
- Saskatchewan Food Processors Association
- Saskatchewan Fruit Growers Association
- Saskatchewan Herb and Spice Association
- SIAS Office of Applied Research and Innovation
- Saskatchewan Ministry of the Economy

- Saskatchewan Pulse Growers
- Saskatchewan Research Council (SRC)
- Saskatchewan Trade and Export Partnership (STEP)
- The Saskatoon Colostrum Company Ltd.
- Saskatoon Regional Economic Development Authority (SREDA)
- Springboard West Innovations Inc.
- Syngenta
- Terra Grain Fuels
- Vaccine & Infectious Disease Organization (VIDO)
- Viterra Inc.

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## Photo sources:

- Agriculture and Agri-Food Canada
- Ag-West Bio
- istockphoto.com
- POS Bio-Sciences
- VIDO-InterVac

