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Pulse Crop News
Official Magazine of Alberta Pulse Growers

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Pulse Crop News is the official journal of and published by Alberta Pulse Growers. This is a producer organization funded by sales of pulse crops (beans, peas, lentils, fababeans, soybeans, and chickpeas) grown in the province of Alberta. Current circulation of this quarterly publication is 6,300+ copies and is distributed to producers, government, and industry involved in the special crops field. The views expressed in articles and advertisements are those of the contributors and do not necessarily represent the views of Alberta Pulse Growers. Contents of this publication can only be reproduced with the permission of APG.
If we were to plot interest in pulses domestically and internationally, you would see that the pulse industry has been on a very exciting upward curve for quite a while. However, I eagerly anticipate that curve to be on a steep incline over the next few months and, dare I say, years. Ever since December 2013 when the United Nations announced that 2016 would be declared International Year of Pulses (IYOP), everyone associated with growing, buying, or selling pulses has been actively planning to maximize the value of the coming year.

In recent months, we have witnessed the development of an IYOP website aimed at consumers. This resource is currently available as it nears completion. Also in development are videos for consumers and health professionals, lunch and learn presentations for medical professionals highlighting research supporting the positive effects of eating pulses on disease prevention and treatment, food industry technical seminars, and so much more in preparation for the official launch. Perhaps the most exciting development is that a global PULSE brand is being prepared for launch this fall. This is branding that will proudly appear on products declaring to consumers that they contain pulses!

In April, traders, growers, marketers, researchers, and food professionals from around the world gathered in Las Vegas for the Global Pulse Confederation’s annual conference (formerly CICILS-IPTIC). At a conference that is known for networking and deal making, there was an additional buzz this year as many of the speakers and sessions focused on the upcoming global pulse brand and the opportunities presented by IYOP 2016.

In this issue of Pulse Crop News, we are talking about just that with a focus on the valuable research projects made possible by investment of check-off dollars from pulse producers like you and me. Read on to learn how APG is working to improve your experience with pulses, and how IYOP will improve the world’s understanding and utilization of this surprisingly good crop that we grow!
Executive Director's Message
Leanne Fischbuch, Executive Director

This Pulse Crop News issue features research. The directors and staff of the Alberta Pulse Growers are committed to investing in research that addresses the needs of the pulse industry in Alberta. The majority of grower funding in the organization is directed to support research in many areas of agronomy, genetics and market opportunities.

From investments made years ago to address market access issues to positively determine that nematodes in shipments bound to India were not the pests that cause stem and bulb diseases, to investigation of genetic research for stronger and healthier pulse crops that are appropriate for the marketplace and current work on emerging diseases, research continues to lead to significant advances which will translate to grower profitability.

Today’s big issues, like investigation of the Fusarium Complex of root rots in pulse crops, are being tackled by scientists with significant support from the industry in the hope that they can be as successful in addressing research as other projects have been in addressing other issues in the industry. We are also pleased to feature a story involving Agriculture and Agri-Food Canada’s only lab that tests dry bean canning quality. This is an important factor in the development of the Canadian dry bean genetics program led by Dr. Parthiba Balasubramanian and is supported with leveraged funding from industry and Science Cluster 2 federal government funding.

Please take a moment to read through the summary of APG’s current projects to learn more about where grower investment is focused.

Also in this edition, the global pulse industry came together to discuss the 2015-16 pulse crop year for the trade. Various crops and the outlooks for the crop year were discussed at the Global Pulse Confederation conference. It is always interesting to learn the reaction from growers when they see the enormity of the industry and begin to understand the challenges and demands from importing nations. We also begin to understand where Canada sits in the global marketplace. Check out page 14 to learn about Canada’s role as a significant player in the pulse industry.

Nationally, we are approaching the Canadian Special Crops Association conference, planned for June 21-23, 2015 in Calgary. This conference looks at the national industry and assesses the market outlooks for the upcoming year. Because it is held in June, there will be good information about the planting of pulse crops in Canada and elsewhere. This information was not as clear during the International Conference held in April. APG will be participating at the event hearing updates on transportation, International Year of Pulses celebrations, and other issues and opportunities that are facing the industry. The national MISSION: IMPULSEIBLE Student Food Processing Development competition is also being held during the conference. Alberta’s entry into the competition were students from the University of Alberta who have a fantastic product that they hope will be top in the minds of the judges during the competition. See page 36 to learn more about their journey to the national event.

Finally, I am excited to announce that two new staff members have joined the organization. Debra McLennan, APG’s new Food and Nutrition Coordinator joined us in May. Debra has organized the past two MISSION: IMPULSEIBLE competitions in Alberta and has been a huge supporter of pulses in her work as a Registered Dietitian. Her profile is on page 6.

APG is also excited to welcome Nev-in Rosaasen to the role of Policy and Program Specialist. Nevin joined the organization in June, and he will be featured in a future edition of PCN. Nevin will be working with farmers to address their immediate pulse agronomic questions, as well as taking on a new role with APG to help formulate policy for the organization. Nevin has most recently been a research economist with Alberta Agriculture and continues to keep his practical farm skills sharp working on his family’s farming operation in Saskatchewan.

While you enjoy this issue of Pulse Crop News please keep in mind that your investment of service fees to the organization enables the various projects and the scientific researchers and staff throughout Canada who are working on pulses to help keep our industry moving forward and innovating for success. Our goal is to help growers like you to sell more pulses, and through research and innovation success we are on our way.
The Alberta Pulse Growers welcomes Debra McLennan as its new Food and Nutrition Coordinator tasked with teaching more Albertans how to benefit from including dried peas, beans, lentils and chickpeas in their diets.

“We are thrilled to have a staff member dedicated to educating consumers about the benefits of eating pulses, especially a dietitian with Debra’s knowledge, experience and enthusiasm,” said APG Executive Director Leanne Fischbuch. “Nutritious and delicious, pulses are surprisingly good for you and your health. The addition of Debra to our team will help to get the word out to more Albertans about the benefits of eating pulses as we prepare for International Year of Pulses 2016, as declared by the United Nations.”

McLennan is a University of Alberta alumnus who has been designated as a Registered Dietitian for 25 years.

“I’m very excited about the opportunity – it’s a dream job for me,” McLennan said. “I have always been a big fan of pulses and the concepts behind them. I’m excited to be more involved in the hands-on food side of promoting pulses and supporting farmers. It’s a great team that I am joining. To be one of the pieces of the puzzle to educate people about the value of pulses to human health is very exciting.”

Some of McLennan’s favourite memories include visiting her grandfather’s farm near Meadow Lake, Saskatchewan. Her previous work experience includes developing and reviewing menus for various clients, and working in the continuing care sector for the last seven years. She has always promoted pulses and looks forward to teaching even more people about the nutritional value and versatility of pulses like dried peas, beans, chickpeas and lentils.

“There has been a lot of research done to support the benefits of eating pulses and there is so much opportunity to connect,” she said. “APG has programs in the schools and I’m looking forward to doing even more outreach. The next step is figuring out how we can best reach out to restaurants and chefs. It’s slowly coming but more work needs to be done. My focus is on reaching out to consumers.”

McLennan practices what she preaches by enjoying pulses as part of her family’s diet. Her favourite pulse dish is a black bean soup that she first tasted on a trip to Disney World. Loving the taste was much easier than finding the recipe.

“It has rice on the bottom, and it’s garnished with sour cream and cilantro,” she raved. “For years I searched for a soup recipe that would come close, and I finally found one but I doctor it a bit.”

Her second favourite pulse dish is “regular old hummus.”

McLennan was contracted to organize the Alberta Pulse produced provincial MISSION: IMPULSEIBLE Student Food Product Development Competition for the last two years.

“I like the concept that we are promoting a product that is locally-grown,” McLennan said of the competition. “I like the fact that we get post-secondary students involved and I’m always blown away by the creativity. If the competition opens their eyes to using pulses and cooking more and where their food comes from, that’s a great mission in itself.”

The St. Albert resident said that she has maintained the status quo for the provincial MISSION: IMPULSEIBLE competition so far as a contractor, but now that she is APG’s Food and Nutrition Coordinator she will really make the event her own.

“Now that I will be seeing the big picture for it, I will look at ways to entice the students to participate even if they aren’t given class time to prepare,” McLennan said. “I will be looking at what we can do to help promote this to a different audience and a different group of students. I think it will continue to be a fantastic experience for all who are involved.”

Please see page 36 for more information about this year’s MISSION: IMPULSEIBLE competition.

McLennan can be reached at debramc@pulse.ab.ca.
Ryan Kubinec lives in the Westlock area. He was elected to a three-year term as an APG Director in 2012 representing Zone 3.

**Pulse Crop News:** Please tell us about your family and your farm.

**Ryan Kubinec:** My wife, Cory, and I have three active, young kids. We grow peas, wheat and canola north of Westlock, working together with my brother and parents.

**PCN:** What has been your experience with growing pulse crops?

**RK:** We grew peas on and off for years but have maintained a steady presence of pulse crops for the last 10 years or so.

**PCN:** What percentage of your crop was made up of pulses last year?

**RK:** Although I would like to say I give pulse crops a third of our rotation, we haven’t got there yet. We will pick a few fields with a suitable fit every year.

**PCN:** What are you planning to grow this year?

**RK:** Green and Yellow peas. Faba beans have been grown in our area for years but we haven’t ventured there.

**PCN:** What tips or tricks have you learned growing pulses that you could share with new growers?

**RK:** Having learned from some veteran pulse growers and personalities from our area, basic good agronomy is the key to all crops. Observing and responding to the evolving conditions is different every year.

**PCN:** What sparked your interest in APG?

**RK:** The members of Zone 3 were some of the leading producers in my area. Initially, the opportunity to learn and share my experiences in the pulse and ag industry appealed to me.

**PCN:** What has been the biggest benefit of your involvement as a director?

**RK:** Getting to know the other directors and staff from the province and key pulse contacts from across the country has been the biggest benefit. Seeing how we all do things a little differently and learning along the way makes the time commitment well worth it.

**PCN:** Is there an issue that is particularly important to you?

**RK:** Of course, the research and development of grower-related issues is a key APG activity. However, having a daughter who is celiac has led me to the consumer benefits and advantages of pulse crops. Next year, 2016, is International Year of Pulses, and will bring some much-needed positive attention to modern conventional agriculture. Major food companies are coming on board and this will give us an excellent opportunity to link directly back to a generation of consumers with a positive message about a healthy and sustainable product.

**PCN:** What was the biggest issue facing your farm last year?

**RK:** Last year our area had good yields with good quality that was easy to harvest. There are always issues along the way, but I will gladly take that scenario again.

**PCN:** Why would you recommend that pulse producers get involved with their zone?

**RK:** Getting involved gets your voice heard and the opportunity to influence outcomes of levy dollars. It is an investment that goes a long way to furthering overall grower profitability.

Thank you, Ryan. We are looking forward to continuing to benefit from your contributions to the Board.
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As more than 1,000 delegates left the Global Pulse Confederation’s annual conference in Las Vegas, there was a feeling that couldn’t be denied: It’s our time! Growers, processors, exporters, brokers and food manufacturers from around the world are getting behind a global pulse logo and campaign set to launch in November 2015. Pulses deliver improved nutrition, better health, and environmental sustainability, and the brand campaign aims to ensure that the world knows.

The launch of the brand campaign will coincide with the kick-off of the United Nations designated International Year of Pulses in New York in November.

Developing a Global Pulse Brand
The pulse industry commissioned Leo Burnett, a Chicago-based ad agency, to produce several concepts for the brand. In-depth consumer interviews took place in Boston, Chicago, Long Beach and Toronto to test these concepts.

Simultaneously, a series of consultations were held with retailers, food manufacturers, ingredient companies, and pulse trade from around the world. These intensive consultations and consumer insight research influenced the choice of logo and tagline.

Alongside the logo and campaign, a global website for consumers will be launched.

Brand Concept
The “pulses” logo is designed for use around the world, and will have enough flexibility to allow for local market modifications and translations. The word “pulses” will appear above the logo in every market, and the white space can be used for local adaptations (as in the Turkish example shown to right).

Research conducted by Leo Burnett confirmed that the tagline “The Future of Food” has global appeal. The “pulses” brand campaign is designed to inform and inspire a millennial generation; an audience that expects more from food. It represents the unique contribution that pulses make to society’s need for improved nutrition, better health, and sustainable food sources.

North American Advertising Campaign
Along with the brand, Leo Burnett will develop an advertising and promotional campaign targeting people under the age of 30 in North America. The campaign will use a combination of social media and traditional advertising to drive consumers to the “pulses” website.

What does the research show?
Consumer research shows that very few consumers in North America know what the word “pulses” means. When consumers are told that pulses are chickpeas, lentils, peas and beans, they recognize them, but often consider them a cultural food or food of the past. That said, the benefits of pulses very much align with consumer interests and food trends. The brand campaign will help consumers make this connection, and see pulses as a perfect fit for their diet.

Food manufacturers are looking for alternative protein sources and cleaner labels (reducing use of highly processed ingredients), which means pulses are positioned very well as a future ingredient. But manufacturers need help educating consumers to drive demand. They appreciate the white canvas under the word “pulses” as it provides a clean slate and tremendous opportunity to tell the pulse story of health, nutrition and environmental sustainability.

Re-launching a Food Category
The brand campaign will re-launch pulses as a food category. Brand funding partners are developing a user guide for the logo and will soon promote the logo worldwide to the pulse sector and food industry.

Food manufacturers around the world have already expressed interest in using the logo on food products and securing these partnerships is the next step in bringing the brand to life. This is our time. Pulses are the future of food.
Ever since the United Nations declared that 2016 would be the International Year of Pulses (IYOP), the pulse world has been busy brainstorming, budgeting, and planning ways to take advantage of such a momentous opportunity.

IYOP aims to increase awareness of pulses—the dry, edible seeds of pea, bean, lentil, or chickpea plants. Canada is a global leader in pulse production, with over 30 per cent of world pea production and 40 per cent of world lentil production. Canada is the largest exporter of pulses in the world, exporting to over 150 countries. The Canadian pulse industry will use events, campaigns, websites and social media to ensure that by the end of 2016, more people know what pulses are, how they can benefit from them, and why they are important in Canada.

The hope is that through IYOP, pulses will be positioned as a source of protein and other essential nutrients, so the Global Pulse Confederation chose four thematic areas to focus on:

1. **Food and Nutrition Security and Innovation – Focusing on the health and nutrition benefits of pulses.**

   Pulses are high in protein, fibre, and vitamin content; they have a low glycemic index; they’re gluten-free and generally non-allergenic; and their flour or puree can be used to improve the nutritional content of many existing food products.

   Pulses as part of a healthy balanced diet have been shown to have an important role in preventing illnesses such as cancer, diabetes, and heart disease.

   In a nation such as Canada, promoting daily pulse consumption can be a cost-effective and sustainable solution for families, to improve their overall health.

2. **Productivity and Environmental Sustainability – Focusing on the environmental benefits of growing pulses.**

   Pulses are an important component of crop rotations, as they require less fertilizer than other crops and can fix their own nitrogen. This helps improve the yield of future crop rotations. Pulses also improve the soil quality by feeding soil microbes, which helps crops to thrive and offers greater protection against disease-causing bacteria and fungi. New research in breeding and agronomics will continue to improve our pulses, adding to these environmental benefits.

3. **Market Access and Stability – Ensuring pulses can be grown and marketed locally and internationally, with maximum safety and minimal restrictions.**

4. **Creating Awareness – The International Year designation creates a large and unique opportunity to increase awareness of pulses.**

   In many countries, there is little public knowledge of pulses, their attributes, or their ability to contribute to increased food security and environmental sustainability.

**IYOP International**

These theme areas will guide activities internationally, nationally, and locally. The following is a sampling of the IYOP activities in the works for over 30 countries:

- In November, pulses will be featured prominently at the Scientific Symposium on Pulse Nutrition and Health, hosted by the Sackler Institute at the New York Academy of Sciences. This is a health and nutritional event targeted at UN agencies, health related non-governmental organizations and research foundations. There will be a strong focus on sustainability and food security, and there is a planned Annual Publication for the New York Academy of Science to come from this event.
- In February, there will be a Pulse Conclave in India. Organized by trade, one of the interesting aspects of this event is that it will feature a food product development competition.
- In March, the Pan African Legume Conference will be held in Zambia. Associated with USAID (United States Agency for International Development), it will focus on pulses, food security, and production issues in Africa.
- In October, the United Nations World Food Day Celebrations will occur in Rome, with a major focus on the role of pulses in improving global food security.

Along with these activities happening at an international level, there are many initiatives occurring within countries. For example, Brazil has developed “Projeto Mais Feijão”, or “Project More Beans”. This program will work with school children in Curitiba, teaching them about the benefits of pulses. Not just an IYOP event, this is intended to become a permanent activity aimed at fighting junk food consumption amongst children. The project will prepare teaching materials, and work with education departments and schools to ensure that the message is heard by Brazilian youth.

In Japan, pulses were on display at the FOODEX convention in March, promoting 54 kinds of pulses to 77,000 visitors from 83 countries. An award–winning chef prepared dishes along with a pulse farmer from the north of Japan, where the majority of that country’s pulses are produced.

**IYOP Canada**

Canada’s focus is to increase consumer awareness of pulses, as well as to increase their use in food processing and manufacturing. This effort involves Pulse Canada, Alberta Pulse Growers, Saskatchewan Pulse Growers, Mani-
toba Pulse & Soybean Growers, Ontario Bean Growers, Canadian Special Crops Association, Farm Credit Canada, Alberta Crop Industry Development Fund and Agriculture and Agri-Food Canada – all partnering to make IYOP a success.

The first official Canadian event will be the IYOP launch in Toronto on January 6, 2016. This kick-off event will draw in Canadian media, food companies and chefs. Simultaneously, other countries – ideally one from each time zone – will hold national IYOP launches.

An international pulse brand will be launched alongside IYOP. A major advertising firm was hired to design a brand and tagline. This brand will be launched in November, with the hope that it will eventually appear on all products containing pulses in stores around the world—improving the consumer’s ability to choose well.

In addition to the brand, the Canadian committee has been developing videos that can be shown at all types of food and nutrition events, and incorporated into websites.

A website is also being developed that will provide information about events and activities going on in North America as part of IYOP. Internationally, www.iyop.net will keep you up-to-date on all pulse-related news.

One exciting project that Canada has on the go is a collaboration with the Canadian Agriculture and Food Museum first in Ottawa. They are developing an interactive pulse exhibit that the Canadian IYOP committee plans to have displayed in Ottawa, then moved around the country to reach as many consumers as possible in high-impact locations, like summer exhibitions, airports, and large shopping malls in 2016 and beyond.

This exhibit will be displayed in two of Canada’s innovative institutions. CIGI (the Canadian International Grains Institute) and POS Biosciences are developing a two-part course aimed at food processing companies. Together, these courses are designed to increase the knowledge of product development professionals in the food industry, focusing on milling, extrusion, fractionation, and wet processing. Over two, three-day training events, they will give technical information on engineering and economics on the usage of pulses in any food product.

To reach as many health professionals as possible with the message of the benefits of pulses in a healthy, balanced diet, we will record a “lunch and learn webinar” presentation with Dr. John Sievenpiper, a consultant physician at St. Michael’s Hospital, and Associate Professor at the University of Toronto, whose main research includes pulses. His presentation will highlight the latest research related to pulses and obesity, blood pressure, glycemic response, satiety and cholesterol, including an overview of minimum effective doses, magnitude of effect, food forms, and duration of research studies. This webinar will be shown in about 20 teaching hospitals in major cities across Canada in conjunction with a pulse-based lunch and Q & A session.

Culinary promotion is an exciting opportunity. We are holding discussions with Master Chef Canada, as well as several other food media companies to see how they might be able to feature pulses.

All partners are of one mind that pulses can be a very economical, nutritious staple in the Canadian diet. We will be working with local food security organizations—such as community kitchens and cooking clubs—to develop a pulse-based resource kit which will feature simple recipes, cooking tips and interesting facts about the history of pulses and their health/environmental benefit. This kit will be distributed to interested organizations across Canada for use within their programming, to help Canadians improve their overall health and cooking skills.

A group in the United Kingdom has spent a great deal of time developing six lesson plans aimed at schoolchildren aged 9-11 years. The lessons cover topics such as cooking with pulses, pulse consumption around the world and the health benefits of pulse consumption. The plan is to introduce them at teachers’ conventions, so that educators will know they can download them to use in their science, health, or food units.

There is much more that I could say about IYOP. It’s an exciting time to be part of the pulse industry, and the plan through IYOP, and all the international and Canadian activities, is to let the world know that pulses are the future of food.
A tour of European companies researching flavour and anti-nutritional properties of pulses like the ones he grows near St. Paul was eye-opening for an Alberta Pulse Growers Director.

“People really wanted to know what we had to offer and wanted to share what they had to offer,” said APG Zone 5 Director Don Shepert. “I believe the most important concept I’ve learned as a producer on this tour is that there are many people who have a passion for pulses researching flavours, nutrition and processing in order to take pulses to the next level of consumption by the people of this world.”

Shepert joined representatives from Pulse Canada, Agriculture and Agri-Food Canada, Canadian International Grains Institute (CIGI) and Saskatchewan Pulse Growers in Switzerland in March to meet with members of the Pulse Partnership Task Force. The Task Force is a group of engaged processing and industry members who provide strategic direction to the pulse industry on marketing, regulatory, research and processing initiatives to drive commercialization of pulses in processed food applications. This industry sounding board has been meeting for over a year mainly in the United States, but this time the event was hosted by global food processing equipment manufacturer, Buhler, at its headquarters in Uzwil, Switzerland.

“One of the best parts was having time to interact with the Pulse Canada people and really finding out what’s clicking and where things are going,” Shepert said. “Some of the things being done by European researchers in fractionation and other areas are pretty impressive. The main purpose of the trip was to get moving on what’s next, and what’s next is the flavour, anti-nutritional and milling research.”

Shepert’s tour included seeing the Fraunhofer Institute in Germany and Buhler in Switzerland, as well as the French National Institute for Agricultural Research (INRA) and pea processors, Cosucra in Belgium and Roquette in France.

“I think the amount of agricultural and industry research being done in Europe is the biggest takeaway,” Shepert commented. “They are much more aggressive on their research because of the number of people around them. Everybody’s got a big budget for research while we’re still focused on agronomy for the most part and grow lots.”

Located in Germany, Fraunhofer is Europe’s largest organization for applied research. Its research efforts are broad and geared toward health, security, communication, energy and the environment. The Fraunhofer institutes are grouped into seven working alliances devoted to broad research areas. One of the research areas is food production, which focuses on functional ingredients, food processes and sensory and packaging needs. Fraunhofer-Gesellschaft currently maintains 66 institutes and research units with 24,000 staff and a two billion Euro research budget from governments and contract work. Fraunhofer’s research strategy is focused on the optimization of value from a stream of products through the total use of all fractions.

A company called Prolupin spun off from Fraunhofer to produce delicious foods, such as ice cream, lupine milk, pudding, yogurt and curd. These products are made from lupine proteins that are able to offer the taste of milk products to those who are lactose intolerant or allergic to milk.

Shepert raved about the ice cream created from 2.5 per cent lupin protein in place of dairy: “The texture and flavour are great. We were very impressed.”

A delegation from the Fraunhofer Institute met with the University of Alberta in Edmonton in February to discuss opportunities and strategies for research collaboration. The meeting included sharing information about Prolupin and having discussions about the potential for research with faba beans as a functional ingredient in food applications.
Fraunhofer also has a research project in partnership with Buhler exploring the bitter off-flavour of plant protein isolates.

As a result of the European research he saw into what may cause the off-flavour of pulses, Shepert may be making a few changes on his St. Brides area farm after he harvests this year’s peas.

Shepert said NIZO, a Netherlands-based food research organization, spoke about their projects at the Buhler meeting and it was interesting to see the different angles that were being looked at to find out what influences off-flavour in pulses. These angles include preventing off-flavours by using breeding, looking at interaction of enzymes, and optimizing storage conditions. They are also looking at removing off-flavours through hydrothermal treatment, solvent extraction and fermentation, as well as masking of flavours.

“They want to start at the grain bin at harvest, and explore the difference in taste after peas are stored for 10 months,” he said. “I will be more aware of my storage habits and really careful about how peas are stored.”

“Something that I didn’t know before the tour is that peas are full of folic acid which is particularly good for pregnant women, but it’s not readily available,” Shepert noted. “NIZO is looking at how to make folic acid more readily available through fractionation.”

Shepert added: “It was awe-inspiring to be present among many critical thinkers who are leading the dialogue and taking steps to elevate pulses to a new level of nutritional and processing understanding. I was pleased to find a genuine interest in looking for opportunities to collaborate on future projects.”

The APG Director Sees First-Hand the European Quest to Improve Pulse Flavour and Nutrition - Cont’d

The Viterra Alberta Bean Division held grower meetings in Taber and Burdett in February. Attendance was excellent as usual.

The meetings included an update on Viterra corporate and Alberta Bean from the Director of Special Crops, Blair Roth, followed by operations and marketing updates by Owen Cleland and Keven Sawchuk, respectively. Jim Rex gave an overview of on the ABD field variety trial results from 2014 and what the seed outlook was going to be like for 2015.

This led nicely into Dr. Parthiba Balasubramanian’s report on the Ag Canada dry bean breeding program. He provided some insight into what new lines are coming in the near future. Adam Unruh gave a report on his analysis of the 2014 pinto harvest data which broke out how different harvest methods impacted dockage, foreign material and splits. Then the grower awards were presented, with the High Yield going to John Wolosuk from Vauxhall, with the variety “Medicine Hat”, a pinto type bean, which yielded 3,673 lbs. per acre.

The Quality Award went to John and Penny Hopkins from Burdett with a very nice sample of the variety “AC Black Diamond”, a black bean type. After lunch, Dr. Syama Chatterton gave an overview on her work on Bacterial Blight. She noted the importance of quality seed and a good breeding program, and being ready to treat when it is needed to stay on top of the blight issue.

Then it was time to hear from Doon Pauly and Pat Pfiffner on their Bean Nutrient Trials and find out how intensively you can manage the crop to obtain yield and quality. The final speaker of the day was Brian Storozynsky, who shared the data from his White Mould Control Plots.
The world pulse trade converged upon Las Vegas, Nevada for four days of meetings and conference sessions in April to learn, do business and network.

The Global Pulse Confederation (CICILS) conference changes locations each year and the opportunity for it to be so close to Canada provided a fantastic chance to have excellent representation from the Alberta Pulse Growers in attendance. Five members travelled to Nevada to explore the diverse global industry to which Canadian pulse crops are exported.

Among the market outlook offerings, there were sessions and meetings that focused on planning and preparations for International Year of Pulses (IYOP) in 2016. Allison Ammeter, APG Chair and the Canadian Chair for International Year of Pulses, gave an update to conference participants alongside other participating countries about what will be key activities for Canada. Activities are being developed across the globe from many of the major pulse countries such as the United Kingdom, Japan, Australia, United States and Canada.

A centerpiece project for the launch of IYOP 2016 is the development of a pulse brand. Conference participants were brought up to speed on the progress. Industry members working on the project envision that all facets of the industry from grower organizations through to food processors and retail will have an opportunity to capture value from the new brand and the brand campaign. Each segment of the world will have the chance to create a brand campaign around the messages. For North America, the objective will be to increase pulse consumption and focus the brand campaign on the millennial audience.

Linked to the opportunity with the branding initiative, food companies like General Mills, and ingredient suppliers like AGT Foods, presented their vision for the branding effort. Both companies are beginning to see increased opportunity for pulses as inclusions in their whole and ingredient portfolios for the processing industry. Distinguished Canadian diabetes researcher Dr. John Sievenpiper presented about how the pulse health story is progressing towards health claim statements, which will be another marketing opportunity for food processing companies to capitalize on besides the use of the new brand.

The industry also learned about another initiative to spur greater innovation via the Pulse Innovation Project (PIP). Conceptualized at McGill University with researchers, a variety of industry representatives and policy makers, the PIP is a pre-competitive forum for pulse industry innovation. Areas of innovation are recognized specific to food, health and business with an additional influence area for policy. Pulse Canada participates in the PIP and this opportunity to learn and share ideas with the international collaborative team provides clarity for Canadian industry research and leadership.

An important component of the conference are the presentations on market outlooks. Commentary from across the world’s major pulse regions on the various pulse crops were delivered by traders and dealers to a packed hall of conference participants. Outlooks included commentary on lentil, dry bean, chickpea and field peas plus some other pulse crops which are not part of the Canadian production but important to the rest of the world.

Estimates on chickpea for 2015-16 were moving higher in the opinions of the traders. For Canadian chickpea production, the observation is that the industry is demanding larger chickpea. Eight millimetre sizes are currently produced in Canada but larger sizes are produced in other parts of the world.

For lentils, the trade is anticipating more lentil acres for Canada. India reported that it is challenged with weather during their rabi crop season (grown November through April) and will most likely be looking to import more lentils to cover their needs. Pakistan is also currently taking contracts for shipment of lentil into January 2016.

APG Vice-Chair D’Arcy Hilgartner said that he received many questions from conference delegates about red lentils.

“The first question was did I have any
red lentils,” he noted. “After that, the people I spoke to wanted to know about my farm and what crops I produced. As well as my ability to export them.”

Faba beans were discussed during the session on dry beans. Of interest to Canadian growers is that the globe is recognizing the increase in faba bean production coming from Canada. European traders shared that changes to European agriculture policy are expected to lead to greater pea and faba bean production across the continent which will increase competition. Other dry beans discussed during the session from the United States and Canada were forecasted to have steady acres similar to last year’s numbers. The only difference is a shift from one bean type to another to address market needs. At the time of the conference (April 12-15), it was expected that there would be downward values on pricing.

The view of the trade for field peas in 2015-16 from across the globe is one that Canada will continue being the major exporter as it currently stands at 54 per cent of exports, followed by France at 11 per cent and the United States and Russia at nine per cent. At the time of the conference, Canadian acreage was expected to be around four million metric tonnes (MMT). China, Canada’s new largest market, is anticipating purchasing over one MMT of peas from Canada this year. Traders cautioned that the demand for green pea would be less than what was seen the past few years and prices would even out to be more in line with yellow pea.

A sub-theme that continued through the market outlook session was transportation. While the Canadian industry continues to work to provide comments to the Canadian Transportation Act review and works with the Ag Transport Coalition, the marketplace wants to know that when they purchase Canadian product that it will be able to get to market. Canadians in the audience assured traders that there are improvements and continued to be hopeful about the harvest in 2015-16. Ammeter said that transportation was the top issue she kept hearing about from delegates.

“They wanted to hear that transportation was not going to be a problem for delivery,” she recalled. “They also wanted to know what the crop quality was like, or going to be like, even though it wasn’t yet seeded.”

Third Member of the APG Executive, Doug Sell, was also concerned about the remarks from delegates regarding transportation issues.

“The trade mentioned that Canada’s reputation as a reliable supplier was really being eroded,” he said. “Our rail system has really let us down, and is costing us sales and profits. Now, it could also be used as leverage by buyers to try and reduce the price offered, so I suppose the perceived unreliability could even hurt us.”

However, Sell’s experience at the convention was generally positive.

“My biggest take away was the scope of our industry on the global stage,” he said. “I really felt privileged to be able to experience first-hand the truly great product we grow and how the international community is looking for and wanting Canada’s production.”

APG Director Don Shepert was impressed by the connections made at the event.

“It’s an industry conference that’s interesting to see from a producer’s perspective,” he said. “I asked a question about green pea prices to a panel and a panel member from Australia came up to talk to me afterwards.”

Overall, for Alberta Pulse Growers, the chance to observe and meet with the global pulse trade provides growers with an appreciation for the complexity and the diversity of our markets.

“I was impressed by the number of international delegates with their diverse needs,” Hilgartner explained. “Different regions of the world were looking for so many different types of pulses. And because Canada is such a large exporter of pulses to the world we were a key part of many of the supply and demand discussions. There was a lot of interest and excitement about the International Year of Pulses, which was great to see.”
The Crop Sector Working Group (CSWG) continues to be involved in a number of agri-environmental issues on behalf of the Alberta crop commissions. Given the research focus of this issue of Pulse Crop News, this is a good opportunity to discuss an interesting Alberta research initiative with both agricultural and environmental aspects and impacts.

The new Alberta Wetland Policy was implemented in the settled or White Area of the province as of June 1, 2015 and in the Green Area – public lands – next year. Under the new policy, wetlands impacted by urban and industrial development will need to be avoided if possible, minimally impacted or replaced with new wetlands of equal or better functional value (the mitigation hierarchy). Farmland is a primary target for restoration in the White Area because much of it has been drained in the past and restoration is relatively straightforward where drainage structures are in place. Ducks Unlimited has a lot of experience restoring wetlands on private farmland and wetland restoration on private land is, and will continue to be, voluntary. The problem is, there are too few landowners willing to take land out of production to restore wetlands because of the long-term loss of production, the inconvenience of farming around wetlands, and inadequate compensation. As well, under the new policy, demand for restoration sites will be greater with the higher standards for restoring wetland value.

A very interesting research project has recently kicked off through the Alberta Land Institute (ALI), an independent research institute housed at the University of Alberta. Alberta’s Living Laboratory Wetlands Project is a multiyear research initiative that will be looking at both the science and economics of wetland restoration in Alberta. The study area is the Nose Creek sub-watershed in Rocky View County and part of north Calgary where urban development, rural residential, oil and gas, and farms and ranches are all competing for land and where many wetlands have been drained.

The science part of the project involves determining appropriate sites for restoration, restoring the wetlands and then monitoring them over a number of years. The researchers want to know if the restored wetlands are as good as undisturbed wetlands in terms of their functions like biodiversity, flood protection and water quality improvement. Quantifying the ecological values of the restored wetlands will help determine their functional value and thus, how well they will meet mitigation requirements.

The economics part of the project involves figuring out the real cost of restoring wetlands. A critical component of that is determining a fair system of incentives to encourage landowners to restore wetlands on their crop or pasture land. The research team will use a market-based instrument called a reverse auction to help determine the most economically efficient way to achieve the restoration goals within a limited project budget. In a reverse auction, landowners (the sellers) are asked to submit bids on the amount of compensation they would need to have a wetland restored on their property. The researchers (the buyer) would look at the bids and determine how to get the most bang – restored wetlands – for their limited budget. Then the team will carry out the restoration on the selected land and monitor the health and functions of those wetlands.

With an unlimited budget, the team would likely find all kinds of willing landowner partners to restore many wetlands and the province might be inundated with wetlands. In the real world, budgets are limited and achieving wetland restoration goals in an economically efficient and scientifically effective manner is necessary.

There are still a couple of big questions in the wetland story. For this project, the team has a source of research funds to pay compensation to landowners. In Alberta, the government expects industry and developers – those impacting wetlands – to pay for restoration. Fair enough. However, a few government sponsored pilot wetlands in areas of particular need would be a valuable kick-start considering the public value of wetlands for biodiversity and flood control, among other things.

A bigger question is around the specific goals for wetland conservation and replacement. How many wetlands is enough? What level of wetland function in the province does the government want to restore? Alberta’s Living Laboratory Wetlands Research Project will be practical, on the ground research within a working landscape with conflicting land-use interests that will provide valuable input to the wetland implementation plan for the whole province. Those bigger questions will need further research and consideration.

Sharon McKinnon is the Crop Sector Working Group Policy Program Coordinator. The Crop Sector Working Group is the crop industry group focused on agri-environmental industry issues. Alberta Pulse Growers is a member organization, along with Alberta Canola Producers Commission, Alberta Barley Commission, Alberta Wheat Commission, Alberta Potato Growers, Alberta Sugar Beet Growers, and Alberta Oat, Rye and Triticale Association.
A revolution in dry bean and faba bean disease protection, NEW Propulse® fungicide has exceptional activity on anthracnose and, most importantly, white mould.

By combining the proven protection of prothioconazole and NEW fluopyram, Propulse offers groundbreaking disease protection and exceptional yields.

For more information, visit: BayerCropScience.ca/Propulse
The Alberta Pulse Growers have long been funding research that examines the positive effects that eating pulses has on blood sugar regulation.

Resistant starches are slowly digested preventing spikes of blood sugars that diabetics struggle to control. But there are also other ways that pulses help protect against the development of obesity and diabetes.

Human intestines are teeming with a diverse and abundant population of microbes. Most of the time these microbes promote health, but it has recently been shown that if this population becomes unbalanced, it can contribute to the development of diseases such as obesity and diabetes. When we eat an unhealthy diet, we are pushing our microbial populations in the wrong direction.

Dr. Ben Willing, a Canada Research Chair in the Microbiology of Nutrigenomics at the University of Alberta, and his team believe that pulse products push our microbial population back in the right direction.

To prove this theory, he has recruited a whole herd of mice and rats to help. More and more the answers to our well-being are being associated with intestinal health. Microbes in the gut send signals to the intestinal wall to fortify the barriers, making for a healthier intestine; and if microbes aren’t sending the right signals the intestine becomes permeable to things we want to keep out. By examining the changes in the intestinal populations of mice when fed different diets, the U of A scientists are able to extrapolate the effect in the human intestinal environment.

Willing is examining how the inclusion of pulses, in particular peas, impacts these microbial populations in hopes of understanding why pulses have the beneficial impact that they do, particularly regarding blood sugar regulation, which is termed glucose tolerance. He has isolated two potential components that are likely the keys to this mystery.

In the last months of this research, positive steps are being taken to understand the mechanism of this action. Three objectives in particular are helping to frame the research being done.

1. Test the direct antimicrobial activity of anthocyanidins on isolates of gut microbes.

2. Determine the changes in gut microbes induced by pea seed coat fractions associated with improved glucose tolerance in rats fed a high fat diet.

3. Examine the effect of pea seed coat fractions on the microbial population and how these impact the integrity of the intestinal wall and their ability to protect against pathogens.

To date there have been some interesting learnings, all of which lean to a very positive picture about the impacts of pulses in our diets. Any research requires repetition and sometimes minor adjustments once initial measurements are taken. The first mouse experiment indicated that there is improved intestinal integrity associated particularly with compounds within the seed coat of peas containing proanthocyanidins; this is demonstrated by a decrease in pathogens within the gut system itself.

It is suggested that different pea varieties may have different impacts on gut health, and Willing and his team are comparing two varieties to evaluate this hypothesis. Microbial analysis of rats fed high fat diet in combination with pea seed coat showed very distinct effects of both Solido and Canstar, although their effects are very different from each other. Both varieties are associated with benefit, but in different ways. This may allow people to choose to consume different varieties of peas according to an individual’s greatest health needs, which may be a future research project in itself!

For more information about APG funded research visit www.pulse.ab.ca.
Another growing season is upon us, and the pulse industry in Canada, including Alberta Pulse Growers (APG) and Pulse Canada, collaborated to bring you the latest information on maximum residue limits (MRLs). It is important to inform growers on any desiccant/harvest management tools that may cause marketing restrictions. Here is an update on product information on the 2015-16 season.

Desiccants and harvest management tools are used by growers all over the world to help facilitate efficient and timely harvest in crops with uneven maturity. The desiccation process rapidly destroys plant cell membranes to allow lush green plant (crop and weed) material to dry quickly prior to harvest. Because desiccants are not systemic, there is a risk that if harvest is delayed, treated plants may regrow from lateral buds protected from the initial application. Herbicides registered for desiccation prior to the harvest of pulse crops in Western Canada include: Diquat (Reglone), saflufenacil (HEAT), flumioxazin (Valterra), carfentrazone (Aim, CleanStart), and glufosinate (Good Harvest).

While glyphosate is registered for pre-harvest use for pulse crops, its primary purpose is control of perennial weeds. Drydown is slowest with glyphosate, especially under poor natural drying conditions, but death of plants is complete – virtually eliminating regrowth of the treated plants. Application of desiccants or harvest aids occurs late in the growing season. Proper application of harvest aids or desiccant products can ensure that growers avoid problems marketing their harvested crops, by not exceeding MRLs set by regulatory agencies in Canada and importing countries.

While the Canadian pulse industry continues to work to reduce risk for growers in marketing their pulse crops, each herbicide must be addressed individually and not all desiccants may have MRLs established in certain markets and for certain crops. Growers must be aware of international regulations that might limit their marketing options. This year, guidance from the pulse industry around those regulations includes faba beans. Producers may desiccate faba beans with Reglone (diquat) or they may also use glyphosate. Various glyphosate products can be used according to the Minor Use Registration, but check the 2015 Alberta Crop Protection Guide for application instructions.

**How to reduce your risks**

As per guidance in previous years, in order to reduce risks associated with exceeding MRLs and maximize options for marketing crops, growers should do the following to keep product residues at trace levels or levels well below accepted maximums:

- Do not exceed the pesticide’s application rate according to the label.

*Continued on page 21

### PRE-HARVEST TIMING

<table>
<thead>
<tr>
<th>Market</th>
<th>Glyphosate as a harvest management tool (e.g. Roundup)</th>
<th>Diquat as a desiccant (e.g. Reglone)</th>
<th>Saflufenacil as a harvest management tool (e.g. HEAT)</th>
<th>Glufosinate as a harvest management tool (e.g. MPOWER Good HARVEST)</th>
<th>Carfentrazone (e.g. Cleanstart, Aim)</th>
<th>Flumioxazin (e.g. Valterra)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (EU)</td>
<td>No marketing issues associated with glyphosate residues for peas, lentils, or chickpeas in the EU. Although there is an MRL set for the use of glyphosate on dry beans and faba beans in the EU, the MRL level is set at a low level of 2 parts per million (PPM) for these crops in this market. Consult with your exporter/processor about dry beans and faba beans destined for the EU. (This applies to the preharvest use only.)</td>
<td>No marketing issues associated with diquat residues for peas, lentils, chickpeas, faba beans, and dry beans. The MRL is in place for these. Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>No marketing issues associated with saflufenacil residues for peas and dry beans. While a lentil MRL is anticipated to be in place in time for the 2016 crop, lentils will not have an MRL in place for the 2015 crop. The product is not registered on chickpeas or faba beans. Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>Lentils are the only pulse crop for which the product is registered in Western Canada. There are no marketing issues associated with glufosinate residues for lentils, as the MRL is in place. Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>There is no MRL set that would allow for preharvest use on dry beans, chickpeas, or peas (not registered on lentils or faba beans). In cases where crop is destined for the EU, growers and exporters should confer prior to using the product in order to avoid marketing problems in the EU. (This applies to the preharvest use pattern only.)</td>
<td>No marketing issues associated with flumioxazin residues for dry beans (not registered for harvest aid use on other pulses). The MRL is established. Follow label directions to minimize residues and maintain levels below the MRL.</td>
</tr>
<tr>
<td>Market</td>
<td>Glyphosate as a harvest management tool (e.g. Roundup)</td>
<td>Diquat as a desiccant (e.g. Reglone)</td>
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<td>Glufosinate as a harvest management tool (e.g. MPOWER Good HARVEST)</td>
<td>Carfentrazone (e.g. Cleanstart, Aym)</td>
<td>Flumioxazin (e.g. Valtera)</td>
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<tr>
<td><strong>Countries that rely on CODEX MRLs (e.g. India, Pakistan, many others)</strong></td>
<td>No marketing issues associated with glyphosate residues for peas and lentils. Although there is an MRL set for the use of glyphosate on dry beans, the MRL level is set at a low level of 2 parts per million (PPM) for this crop in this market. CODEX does not have a glyphosate MRL for chickpeas or faba beans. Consult with your exporter/processor about beans or chickpeas and faba beans destined for CODEX countries. (This applies to the preharvest use only.)</td>
<td>No marketing issues associated with diquat residues for peas, lentils, chickpeas, and dry beans. Faba beans will not have an MRL in place for the 2015 crop. Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>No marketing issues associated with saflufenacil residues in CODEX countries. The MRLs are set for pea, lentil, and dry bean desiccation uses (the product is not registered on chickpeas or faba beans). Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>Lentils are the only pulse crop for which the product is registered in Western Canada. There is no CODEX MRL set for glufosinate on lentils. Consult with your exporter/processor before using product on lentils.</td>
<td>There is no MRL set that would allow for preharvest use on dry beans, chickpeas, or peas (not registered on lentils or faba beans). In cases where the crop is destined for CODEX countries, growers and exporters should confer prior to using the product in order to avoid marketing problems.</td>
<td>There are no CODEX MRLs established for flumioxazin at this time. In cases where the crop is destined for CODEX countries, growers and exporters should confer prior to using the product in order to avoid marketing problems.</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>No marketing issues associated with glyphosate residues for peas in Japan. Although there is an MRL set for the use of glyphosate on dry beans, lentils, chickpeas, and faba beans, for Japan the MRL is set at a low level of 2 parts per million (PPM) for these crops in this market. Consult with your exporter/processor about dry beans destined for Japan, as well as for lentils, chickpeas, and faba beans. (This applies to the preharvest use only.)</td>
<td>No marketing issues associated with diquat residues for peas, lentils, chickpeas, faba beans, and dry beans. The MRL is in place for these. Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>No marketing issues associated with saflufenacil residues in Japan. The MRLs are set for pea, lentil, and dry bean desiccation uses (the product is not registered on chickpeas or faba beans). Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>Lentils are the only pulse crop for which the product is registered in Western Canada. There are no marketing issues associated with glufosinate residues for lentils, as the MRL is in place. Follow label directions to minimize residues and maintain levels below the MRL.</td>
<td>No marketing issues associated with carfentrazone residues on dry beans, chickpeas, or peas (the product is not registered on lentils or faba beans). The MRL is set and is adequate for preharvest uses. Follow label directions to remain within legal limits.</td>
<td>No marketing issues associated with flumioxazin residues on dry beans (the product is not registered for harvest aid use on other pulses). The MRL is set and is adequate for preharvest uses. Follow label directions to minimize residues and maintain levels below the MRL.</td>
</tr>
</tbody>
</table>
• Time the application according to the pesticide label. Early application of desiccants or glyphosate greatly increases the risk of higher herbicide residue.

• Consult with your exporter/processor about the use of harvest management aids as they pertain to international markets.

• Consult the above Pulse Canada chart indicating market considerations and regulatory status of specific pesticides for certain key markets.

The 2015 Alberta Crop Protection Guide (commonly referred to as the Blue Book) has the most up-to-date information for crop protection and includes information regarding harvest aids and desiccants. Hard copies may be purchased from the Alberta Agriculture and Forestry website or accessed free of charge in electronic format at www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex32.

*Chart information provided by Pulse Canada. The charts in this article are not recommendations for the use of any one desiccant/harvest management tool over another.
APG Research Investment: Food, Health and Marketing Projects

APG Market Research Projects

Richardson Centre for Functional Foods and Nutraceuticals

Peter Jones, University of Manitoba

Pulses have strong potential to impact post-prandial glycaemia, satiety/food intake and endurance based on their composition of complex carbohydrates, protein and low GI. However, there is a need to test the impact of pulse flour and fraction ingredients within food matrices of interest to food manufacturers in order to increase commercialization of pulse food products and substantiate health claims. This three-year project includes a series of acute human studies designed according to Health Canada’s proposed guidance for satiety and post-prandial glycaemia claims as well as guidance from the European Food Standards Agency (EFSA) on substantiating claims related to satiety/weight management, post-prandial glycaemia as well as endurance. The food products to be tested in the human studies represent the same food categories of interest in the food prototype projects for the current AIP application with dose amounts of pulse ingredients relevant from an optimal taste and functionality perspective, as well as the ability to impact the health outcomes being tested.

Pea fibre cookies formulated for the clinical trial.

Effect of pulses as a source of fibre and resistant starch on satiety hormone production

Raylene Reimer, University of Calgary

The objective of the project is to assess the integrated gut satiety (full feeling) hormone and intestinal microbe response to pulses in the obese gut. The experiments will provide information regarding the effectiveness of pulse fibres in altering gut satiety hormones and gut microbe profiles. This evidence will be invaluable in designing future dietary therapies based on pulses.

Determination of host status of field pea and its associated rotations and weeds to stem and bulb nematode in the Canadian prairies

Mario Tenuta, University of Manitoba

This project builds on previous work that focused on determining the classification of the nematodes and identifying host plants. The strategic approach is collaboration between commodity boards and processors to address export access issues. The objectives are: 1) to conduct a field survey to confirm infestations; 2) conduct a greenhouse study to confirm that the weed species are the host for the nematode; and 3) rapid molecular determination of the race of the nematode and host.

Evaluation of pulse fibre supplementation in obesity and the metabolomic syndrome: Generating evidence in support of health claims

Raylene Reimer, University of Calgary

This project will assess the potential of pulse fibre to improve weight control and glycemic response. If consumption of pulse fibre will improve body composition, then this scientific evidence can be used to encourage consumption of pulse fibre for weight management and glucose control. Additionally, food manufacturers can be encouraged to incorporate pulses into their products as a source of fibre. This will generate and additional use for pulse products and a potential for novel market development.

To identify dry bean germplasm and cultivars with high resistant starch and/or dietary fibre, and to improve nutritional value of dry bean cultivars by pyramiding resistant starch and dietary fibre

John Lu, AAFC Lethbridge

The nutritional value of dry bean has not been fully explored and utilized. Dry bean produced in Canada is primarily exported as a raw commodity. Although dry bean has been identified as a health food with low glycemc index (GI) for decades, the information on its resistant starch and dietary fibres is limited. It will be important and necessary to understand the knowledge gaps that prevent the full utilization of this nutritional powerhouse. This Activity will conduct a comprehensive study to evaluate contents and variations of resistant starch and dietary fibre in dry bean germplasm and cultivars, identify novel dry bean lines with high levels of resistant starch and dietary fibres, and further improve nutritional value of dry bean by promoting its utilizations in health foods. This study will be the first to systematically investigate and characterize resistant starch and dietary fibres in dry bean germplasm and cultivars of diverse market classes. The results of the proposed study will enhance commercial value of dry bean produced in Canada and create new processing opportunities for use in health food.

Substantiating a health claim for pulses (beans and peas) and cholesterol-lowering

Rhonda Bell, University of Alberta

Pulses (beans, peas, lentils and chickpeas) are healthy foods that contain twice the amount of protein as cereals, are very high in fibre, key vitamins and minerals like folate and iron and are low in fat. Canada is the world’s largest producer and exporter of lentils and peas, and Alberta produced 34 per
Canadian pulses in traditional Chinese dry noodle and pilot research

Academy of State Administration of Grain; China Agricultural University, Shandong Dezhou Fengyu

The objective of this project is to explore the feasibility and application of Canadian Pulses in a traditional Chinese dry noodle. The Chinese research group has outlined the following goals: To develop a formulation with more than 10 per cent pulse flour in noodles without any changes to the integrity and taste of the product; and that the product quality matches traditional noodle – nutrition quality significantly improved by including pulse flour.

This is a Pilot applied research product in collaboration with Shandong Dezhou Fengyu to achieve the industrialization development and market expansion of Canadian pulses. Saskatchewan Pulse Growers and Manitoba Pulse and Soybean Growers are also contributing funding to this project.

Application of Canadian pulse flour in Chinese steamed bread

Academy of State Administration of Grain; Wuhan polytechnic University; Angel Yeast Co. Ltd.

The objective of this collaborative project is to investigate inclusion of Canadian pulses in steamed bread applications to develop edible fibre and a fortified product with more rational amino acid compositions for the Chinese market. The specific goals are as follows: Investigate effects of pulse flour with different incorporation levels when mixed with wheat flour and maximize food quality in comparison to original products; and to optimize formulations to process at laboratory level as well as pilot level for two new kinds of Chinese steams bread products, northern and southern type.

Development of a pea protein meat analog by high moisture extrusion

Xiangfeng Meng, Alberta Agriculture and Forestry

The objective of the project is to develop a high quality meat analog with pea protein isolate by high moisture extrusion. We will use a 57 mm twin-screw extruder with an L/D ratio of 24 for protein texturization. A long cooling die will be fabricated and attached to the extruder discharge end to facilitate fibre formation. Preliminary experiments will be performed to optimize ingredient composition and define the limits of processing conditions, on the basis of product appearance, fibre formation, and extrusion stability.

Other proteins and starches will be incorporated in the formulations to enhance fibre formation. The most promising formulation will be used in extrusion experiments to evaluate the effects of feed moisture content and extruder barrel temperature on moisture content, color, and textural properties of the products. The most successful products from the extrusion experiments will be flavoured at Daiya Foods (industry partner). A whole flavour system will be developed to enhance consumer acceptance of the products. The flavoured products will be subject to in-house sensory evaluation. Appearance, aroma, flavour, and textural aspects of the products will be evaluated. The project is expected to lead to commercial value-added pulse products that benefit Canadian
growers and processors by increasing demand for this commodity, and improving their ability to compete in the global marketplace.

**Microbial modifying properties of pea seed coat and their role in improved intestinal integrity and reduced insulin resistance**

*Ben Willing, University of Alberta*

See page 18 for more on this project.

Supplementation of pea seed coats to a high fat diet improves glycemic control, however, the mechanism of action is unknown. The microbiota plays an important role in the development of metabolic disease, including type 2 diabetes and cardiovascular disease. Two components found in pea seed coats that likely impact the microbiota are the fibre and flavonoid fractions. The research team will explore the impact of these fractions on the microbiota, intestinal barrier function and glucose tolerance in the gut. There are three primary objectives:

1. Test the direct antimicrobial activity of anthocyanidins (produced upon acid-cleavage of the flavonoid polymer called proanthocyanidins that occur in pea seed coats) on isolates of the gut microbiota;

2. Determine the changes in the microbiota induced by pea seed coat fractions that are associated with improved glucose tolerance in a high fat diet induced model of glucose intolerance; and

3. Examine the effect of pea seed coat fractions on the microbiota and intestinal integrity when supplementing a normal-fat diet. The impact of these pea seed coat fractions on intestinal resilience will be studied using a mouse model of E. coli infection. This research will deliver new insight into the benefit of pea seed coat supplementation in the human diet, providing expanded opportunities for use as a functional food. It will also identify characteristics of peas that can be optimized through cultivar selection and development.

**APG Production Research Projects**

**General Research**

*Field pea, chickpea, lentil and faba bean breeding – University of Saskatchewan*

*Tom Warkentin (field pea breeder), Bert Vandenberg (lentil & faba bean breeder), and Bunyamin Tar'an (chickpea breeder) University of Saskatchewan*

The objectives of the research are the development and release of cultivars with improvements in one or more of the following traits: yield, early maturity, disease resistance, lodging resistance and seed quality. Full sets of trials from F1 generation to registration and regional trials were planted for each crop totaling in the order of 100,000 plots.

**Alberta Regional Variety Testing**

*Alberta Agriculture and Forestry/ Agricultural Research and Extension Council of Alberta*

The Alberta Pulse Growers sponsor the evaluation of recently registered varieties of peas, lentils, chickpeas, and dry beans. Sites are located throughout the province to provide regional data to assist with your varietal selections in future years.

**Recovery of field crops from hail damage in Alberta using foliar fungicides and nutrient blends**

*Ken Coles, Farming Smarter*

Hail damage crop losses vary depending on intensity, spatial extent and timing in terms of growth stages of the affected crops. Traditionally, producers have few options available after severe hail damage other than reseeding.

Recently some promotions suggest that commercial foliar fungicides and nutrient blends are effective for enhancing crop recovery from wind and hail damage, not only for restoring yields, but also to improve vertical orientation for better crop harvestability (BASF Corporation, 2008). Some studies regarding this indicated a small benefit of foliar fungicides to simulated hail injured corn, thus mitigating economic consequences for the producers. For example, Mueller and Sisson (2013) reported that timing of application after a hail showed a different response and the implications of fungicides on hail-damaged crops merits additional research.

One of the key strengths of this project is the involvement and input of AFSC on assessment of damage and recovery, improvement of the current hail damage and recovery insurance system will improve producers’ ability to manage risk. While there is no perfect way to simulate hail damage, this project will enable a baseline to be established, and to springboard additional studies.

This project will focus on the following objectives:

1. Identify pea, faba bean and dry bean response to simulated hail damage at different growth stages;

2. Potential benefits of using fungicides and nutrient blends on cereal, pulse and oilseed crops damaged with simulated hail events at
3. Identify potential management practices that improve crop growth, harvestability and yield after hail damage

Performance and cost of field scouting for weeds and diseases using imagery obtained with an unmanned aerial vehicle

Chris Nesser, Alberta Agriculture and Forestry Lethbridge

In recent years Unmanned Aerial Vehicles (UAVs) and image processing software have been improved to the point that it is now possible to rapidly generate very accurate aerial orthomages at a much lower cost than was previously possible. This opens up possibilities for a wide range of new applications that require flexible deployment and high resolution, which are characteristics that are not available through satellite imagery. One application with such requirements is crop scouting for weeds and foliar diseases. This project is designed to test the feasibility of using images obtained from a UAV to estimate the distribution of weeds and diseases in six major crops in southern Alberta. Distribution maps will be generated from a combination of field scale and sample scale images and validated against ground observations. The cost effectiveness of this technology will be evaluated and compared to standard scouting methods. The goal is to develop an image acquisition and processing protocol that can produce a useful weed or disease distribution map in no more than one hour and ultimately lead to better weed and disease management.

Civilian uses for Unmanned Aerial Vehicles (UAVs) are rapidly expanding as the technology is becoming more affordable. Today’s most common UAVs for professional use are capable of payloads of 1-5 kg, have flight times of 15-30 min. and ranges around 1.5 km. These characteristics make them ideal for deployment at a quarter section scale. Because of this crop scouting has been proposed as a potential application, but experimental data is needed to verify its potential feasibility and accuracy.

Bean Research Projects

Dry Bean Improvement for Sustainable production in Canada
Parthiba Balasubramanian, AAFC Lethbridge

Sub-activity 1: Selection for dry bean canning quality

See page 30 for more on this project.

Acceptance of dry bean cultivars is dependent on both dry seed (seed size, shape, colour, retention and seed coat integrity) and processed seed (canning quality) traits. Percentage hard-to-cook seed, hydration coefficient after soaking and blanching, washed drain weight, texture, colour, clumping and appearance of seeds after canning are important traits to processors and consumers. A greater understanding of the above factors will enable: i) breeders to select genotypes with improved canning quality traits in a breeding program; ii) growers to choose cultivars with optimum quality for commercial production in their respective growing environments; and iii) processors to refine the canning protocol depending on the cultivar.

Sub-activity 2: Early maturing lines with improved disease resistance

Dry bean cultivars of six (pinto, Great Northern, yellow, black, red and pink) bean market classes are grown in rotation with cereal, oilseed, potato, sugar beet and forage crops primarily under irrigation. The days to maturity of dry bean cultivars range from 100 to 105 days in Alberta which has a short growing season on the prairies. A major impediment to dry bean production is the lack of early maturing dry bean cultivars with adequate level of resistance to the most prevalent diseases including white mould and common bacterial blight. Development of disease resistant cultivars is one of the most effective and environmentally sustainable methods for reducing yield losses and promoting stable crop production.

Sub-activity 3: Micro-climate management for white mould disease control

Sclerotia of S. sclerotiorum can only produce apothecia in the top 4 cm of the soil. Factors affecting sclerotia germination under lab conditions have been extrapolated to understand sclerotial germination behaviour as it relates to microclimate variables, disease development and yield potential under field conditions. Based on these studies, allowing the top 4 cm of the soil to dry should negatively affect ascospore production and subsequent initiation of disease onset. However, the effect of microclimate and fluctuating wet and dry periods on ascospore release and white mould development have rarely been investigated under field conditions. The proposed research would aim to determine whether microclimate management, provided by changes in irrigation scheduling and dry bean canopy architecture, could decrease the rate of ascospore release during the susceptible flowering period, without negatively affecting bean yield. As a result, disease management of white mould of dry bean will be enhanced by de-synchronizing time of sporulation with crop susceptible period through modification of plant architecture and irrigation.

Sub-activity 4: Improved nutritional values of dry bean to promote its utilization in health foods

The nutritional value of dry beans has not been fully explored and utilized. Dry bean produced in Canada is primarily exported as a raw commodity. Although dry bean has been identified as a health food with low glycemic index (GI) for decades, the information on its resistant starch and dietary fibres is limited. This Activity will conduct a comprehensive study to evaluate contents and variations of resistant starch and dietary fibre in dry bean germplasm and cultivars, identify...
novel dry bean lines with high levels of resistant starch and dietary fibres, and further improve nutritional value of dry bean by promoting its utilizations in health foods. This study will be the first to systematically investigate and characterize resistant starch and dietary fibres in dry bean germplasm and cultivars of diverse market classes. The results of the proposed study will enhance commercial value of dry bean produced in Canada and create new processing opportunities for use in health food.

**Solid seeded dry beans in Southern Alberta**

**Doon Pauly, Alberta Agriculture and Forestry Lethbridge**

The three major objectives of this project are to: 1) determine the optimum row spacing and seeding rate for one Pinto and one Great Northern bean genotype with the best agronomic characteristics; 2) determine optimum nutrient requirements using urea and ESN (polymer coated slow release urea) fertilizer types and rates, including in-crop N applications with one genotype, with and without inoculant; and 3) determine optimum application practices for solid-seeded beans for white mould control. This experiment will be carried out at three locations: Vauxhall, Taber and Bow Island over three growing seasons.

**Improving Sclerotinia disease control in edible beans and canola**

**Michael Harding, Alberta Agriculture and Forestry Brooks**

Diseases caused by *Sclerotinia sclerotiorum* are an enormous production constraint to many crops across Alberta and the prairies. Recently two novel approaches to control of this disease have been identified and shown excellent promise in proof-of-concept trials. The results from this study will provide the evaluation needed for producers to utilize combinations of products already available that will give superior white mould control.

**Dry bean improvement through tepary beans**

**Kirstin Bett, University of Saskatchewan**

Tepary bean (*Phaseolus acutifolius*) is being re-visited by several dry bean breeding programs as a source of tolerance to various biotic and abiotic stresses. It is already the source of tolerance to common bacterial blight used by all North American breeders. In the field last summer, we observed halo blight and bacterial brown spot tolerance in our interspecies hybrid offspring from crosses between susceptible common bean and tepary. We would like to propose a continuation of the tepary bean genetics project and expand it to include direct collaboration with colleagues in Colombia and Puerto Rico to assess stress tolerance in progeny from crosses between common and tepary bean. We will investigate chilling tolerance and disease resistance in Saskatoon and heat and drought tolerance in Puerto Rico and Colombia. We would use the genomic resources generated under IMAP to map the tepary genome as well as assess the level of introgression of tepary genome in the most promising interspecies hybrids.

**Evaluating foliar fungicides for controlling Sclerotinia white mould on dry bean crops**

**Michael Harding and Brian Storozynsky, Alberta Agriculture and Forestry**

Selecting the best foliar fungicide and application technology is difficult because information is limited. Additionally, much of it based on research conducted with specialized plot equipment on small replicated plots, or is potentially biased in nature. In commercial operations, fungicides are applied to crops with sprayers travelling 15 to 35 km/h (10 to 20 mph) that use large sized nozzles. These nozzles produce coarse droplets that are more pronounced when using current air induced nozzle technologies. Farmers see a disconnection between their spraying operations and typical research studies and are concerned with the impact their chosen foliar fungicides and spray application have on disease control.

In 2014, the research team, comprising of people from Viterra’s Alberta Bean Division, Alberta Agriculture and Forestry at the Crop Diversification Centre South, and the AgTech Centre decided it was important to pursue working with a novel experimental design that was done for the first time in 2013 on commercial dry bean fields. This design included side by side fungicide treatments applied with spray coupe similar those used in commercial fields. The plots were interspersed with perpendicular non-sprayed check areas. To continue this work, three commercial fields in Southern Alberta that had a history of bean production and potentially high development of white mold would be selected for this
The natural host range of this pathogen disease impact.

The distribution of surveillance activities to prevent disease impact.

The objectives of the project include the following components:

1. Evaluate advanced breeding lines in Western Canada Field Pea Cooperative Registration Tests (Pea CO-OP Tests) for variety registration and produce breeder seed of new varieties.

2. Develop and evaluate elite breeding lines at multi-geoclimatic regions to identify adapted genotypes. Field pea production areas in Western Canada include vast geoclimatic regions. The only way to identify adaptability of breeding lines to these regions is to evaluate their performance and select the most adapted ones in each and every region.

3. Develop breeding materials with improved disease resistance and harvestability. Ascobolus and powdery mildew, and root diseases are most common and damaging diseases in Canadian pea production. The level of the diseases, particularly Ascobolus, is associated with standability of a variety, the lesser the level of the diseases the better the standability.

Evaluation of field pea and faba bean germplasm for Alberta growers

Robyne Bowness, Alberta Agriculture and Forestry

The goal of the proposed activity is to increase Alberta pulse production from 5 per cent to 15 per cent of the annual cropped acres (3 million acres), in the next ten years. This activity will...
identify superior pulse varieties suitable for Alberta producers. There are three distinct components to this activity: (1) screening new pulse genetics; (2) western Canadian pulse co-op testing (field pea and faba bean) voluntary sites; (3) regional pulse testing. This project provides a unique method of screening pea and faba bean genetic material from European (Germany, France, Netherlands) and Western Canadian breeding programs. It is less costly than a full breeding program and allows for more rapid registration of the best germplasm for Alberta growers based on varietal performance in specific growing regions.

**Crop rotation to minimize inputs, maximize crop production and optimize profit margin**

**Kabal Gill, Smoky Applied Research and Demonstration Association**

The objectives for this project are to demonstrate the benefits of crop rotations to reduce input costs and pest problems, increase crop production, optimize profit margin and improve soil quality in the southeast Peace region. The results of this trial will help to identify improved crop rotations for the area and showcase the potential of pulses to decrease reliance on N-fertilizer and increase producer profitability.

**Disease resistance in peas: testing of gm traits in Canada and transformations of Canadian material**

**Linda Hall, University of Alberta**

Obtaining effective disease resistance in field pea through conventional breeding methods is challenging and the breakdown of resistance is rapidly occurring. This is a collaborative project with German pea breeder Hans Joerge Jacobson, to test German pea lines under field conditions. The ability to do field trials in Europe is extremely limited and this project will allow the breeder to test disease resistant pea lines to Fusarium root rot and Mycosphaerella blight in the field. These two diseases cost European and Canadian producers significant yield and profit losses each year. This is a valuable opportunity to gain important training and experience in a European lab and to build relationships across international borders.

**Field proofing the use of plant hormones to increase canola, wheat and pea yields.**

**Jocelyn Ozga, University of Alberta**

This is a collaborative project that will build on greenhouse trials that demonstrated significant yield increases when plant hormones were applied to field peas. Field trials will determine if similar responses to the application of plant hormone occur in the field environment. Preliminary testing shows great promise for increasing seed yield in all three crops. This has enormous potential to increase yield and profitability for Alberta producers.

**Development of semiochemical-based monitoring of the pea leaf weevil**

**Maya Evenden, University of Alberta**

A pilot study in 2011-2012 indicated that pea leaf weevles are responsive to pheromone baited traps. This study is building on that positive response to develop a semio-chemical based monitoring system that will significantly improve the monitoring system for these pests. Over the next three years the results generated from this much needed research study will aid in prediction of population levels of the weevil as well as correlate the severity and timing of outbreaks with yield loss of field pea.

**Prevalence, pathogenicity and risk assessment of Fusarium species causing root rot in field pea**

**Syama Chatterton, AAFC Lethbridge**

Root rot in field peas is a major constraint to production causing severe stand and yield loses. This research will take a concentrated look at the pathogens causing disease in peas, the effectiveness in various seed treatments as well as develop a risk assessment tool which will allow producers to determine their level of risk prior to planting. The outcomes of this four year study will be invaluable to providing information regarding the root rot disease complex and provide practical management options.

**Advanced Agronomic Practices in Wheat, Barley and Pea to Maximize Yield and Harvestability**

**Sheri Strydhorst, Alberta Agriculture and Forestry**

Western Canada must advance agronomic practices to increase yields and profitability. Next generation agronomy will include efficient and effective use of: in-crop nitrogen, foliar fungicides, and plant growth regulators (PGRs). Although some of these practices are currently used in Alberta, further research is required to examine their performance in management systems and in combination with other agronomic practices (inter-row seeding, seeding rates & nitrogen stabilizers).

This study will examine combinations of advanced agronomic practices on wheat, feed barley and field pea. Small plot field trials will test interactions of 48 wheat management practices, 52 barley management practices, and 15 pea management practices at Magrath (irrigated), High River (thin black soil), Killam (thin black soil), St Albert (black soil), and Falher (grey Luvisol) to maximize harvestability, yields, quality & profitability.
Lentil Projects

Developing red lentil cultivars for Alberta and analyzing the newest red lentil cultivars for the starch profile to attract new lentil markets

Manjula Bandara, Alberta Agriculture and Forestry

Lentil is mostly consumed as a whole food, and is associated with health benefits. Complex carbohydrates in lentils, essentially starch, are endorsed as a major ingredient responsible for stabilizing blood glucose content. Our preliminary results indicate that depending upon the red lentil cultivar and growing year, the total starch content varied between 43 per cent and 51 per cent and the amylose and amylopectin (resistant and slowly-digested starch, respectively) contents varied between 10.8 per cent and 18.9 per cent, and between 27.0 per cent and 37.5 per cent, respectively. A detail study on the impact of genotype and environment on these starch component contents of newest lentil cultivars would elucidate the genotypic stability of producing these compounds under different environments. Currently, several lentil flour-based food products are being developed or available in Canada. The use of new lentil cultivars with appropriate starch profile would result in a food ingredient with a low glycemic index, which can be used for developing new food products with enhanced health benefits. The proposed project will be focused on selecting red lentil lines with superior agronomic traits, including herbicide resistance, and analyzing newly released lentil cultivars for starch profile, with the following objectives.

1. To develop red lentil cultivars with desirable traits, such as early crop maturity, improved resistant to ascochyta blight and anthracnose, determinate growth habit, upright plant stature, resistant to herbicides and improved drought tolerance.

2. To understand the starch profile (total and digestible starch, and amylose and amylopectin contents) of the newest red lentil cultivars to expand markets for lentil ingredients.

3. To understand the genotype by environment interaction and their relative contribution to variability of the starch profile of newest red lentil cultivars.

Evaluation of the effect of nitrogen rates, seeding rates and herbicide applications on production of Clearfield red lentil in Alberta

Robyne Bowness, Alberta Agriculture and Forestry

Lentil is a valuable crop in rotation particularly because it can supply its own nitrogen requirements. Sustainable lentil production is dependent on effective weed control. Currently there is limited number of products with narrow windows of application. Information on the effect of herbicide on nodulation and the plants ability to produce nitrogen. Additionally, current seeding recommendations are based on large green lentil seeds. It is important for the profitability of lentil production that accurate seeding rate information is available. This project will determine the optimal seeding rate for Clearfield red lentil varieties, the effect of herbicides and how to optimize their use as well as the impact of starter nitrogen on the lentil plants ability to fix nitrogen.

New Crop Projects

Improving lygus management for canola and faba bean cultivars

Hector Carcamo, AAFC Lethbridge

Lygus bugs are native predators that cause damage to a wide variety of crops across Alberta. In recent years they have become a more significant problem in both canola crops as well as faba beans significantly decreasing the quality of both crops. Very little is known about control of these pests in faba beans. This project will focus on opportunities for control, timing of spraying, which chemicals are most appropriate, and economic thresholds of the various control methods.

Identifying promising genotypes, and optimizing seeding density, nitrogen fixation and irrigation for cost-effective soybean production in Alberta

Manjula Bandara, Alberta Agriculture and Forestry Brooks

In order to be competitive on the global market, Canadian crop producers require access to the most advanced genotypes and agronomic practices in their production systems. Southern Alberta, with relatively warmer and longer growing conditions, and over 0.64 million hectares of arable lands with irrigation, provide producers with several cropping options. Soybean is a potential candidate to be included in crop rotation systems in southern Alberta, but for it to be economically viable, superior genotypes and effective agronomic practices should be available to producers.

This multi-site year project will evaluate low heat unit (≤2300 CHU) requiring soybean genotypes for production superiority, and determine the optimum plant population density; efficient irrigation schedule; effective root nodulation based on residual soil nitrogen, and also will compare the economic and rotational benefits of soybean with those of dry bean, a well-established irrigated grain legume crop in southern Alberta. This project will identify superior genotypes and effective cultural practices, which will potentially improve the current provincial average soybean productivity from 2.7 t/ha (40 bu/ac) to over 4.0 t/ha (>60 bu/ac), and consequently helping to increase the soybean crop extent in southern Alberta in support of the local oilseed processing and livestock industries.
Researchers at the AAFC Lethbridge Research Centre are canning beans to find out what makes beans from some fields - and even some from within that field - better for canning than others.

“Some bean cultivars are more prone to developing hard seeds, which is highly affected by the environment,” said AAFC Research Scientist Parthiba Balasubramanian, who works on this issue with Research Technician Gerald Kereliuk. “The objective now is to identify lines with no hard seeds. We also look at the canning quality of the lines and how consistently it performed.”

The Lethbridge researchers began looking at these issues for the whole of Canada in 2011, and they received funding from the federal Pulse Cluster 2 program, as well as APG and other grower groups to continue until 2018.

“If it’s predominantly genetically controlled then we can breed to remove that trait,” Balasubramanian noted. “It could happen in the field during maturation of the seed or it could be during seed storage or it could be during the cleaning process. Because we have little control over environmental conditions, the hard seeds are a concern. This concern was brought to us by the industry, primarily by the people who are exporting beans.”

The project overview states that acceptance of dry bean cultivars is dependent on both dry seed (seed size, shape, colour, colour retention and seed coat integrity) and processed seed (canning quality) traits. Percentage of hard-to-cook seed, hydration coefficient after soaking and blanching, washed drain weight, texture, colour, clumping and appearance of seeds after canning are important traits to processors and consumers. A greater understanding of these factors will enable breeders to select genotypes with improved canning quality traits in a breeding program, allow growers to choose cultivars with optimum quality for commercial production in their respective growing environments, and help processors to refine the canning protocol depending on the cultivar.

“The major end uses of dry bean are cooking and canning,” Balasubramanian said. “The (livestock) feed use of dry bean is negligible. The percentage of broken beans that go into feed use is very small. Gerald was instrumental in fine tuning the protocol for cooking to evaluate the lines for hard seed. The first thing we evaluated was the hard seed because one of the problems is when you soak the dry bean seeds overnight, not all of the seeds absorb water, even if they’re from the same seed lot, even within a variety in the same beaker. We see hard seed in other pulse crops as well so it’s a fairly common phenomenon, but it’s poorly understood.”

The bean cultivars and experimental bean lines grown in Alberta, Saskatchewan, Manitoba and Ontario – navy, Great Northern, pinto, cranberry, yellow, black, white kidney, red kidney and dark red kidney - are soaked at room temperature in double de-ionized water for 14-16 hours, then blanched in hot water for three minutes at 93 degrees Celsius.

“Once they’re blanched, some of the hard seed will pick up water,” Kereliuk said. “There are still some that will never take up water in all of the conditions that we’ve tried, but that is very rare.”

Balasubramanian added: “We just wanted to see if a minor heat treatment would enable these seeds to soak up moisture. Some don’t absorb water so that’s why we go to Step 3, which is the actual cooking.”

The bean seeds are then cooked for 20 minutes at 97 degrees Celsius.

Half of Canada’s bean acres are navy beans, and those are primarily exported to Europe, Balasubramanian noted. The navy beans, canned with tomato sauce, receive a high-pressure steam for 80 minutes at 116 degrees Celsius after the cans are sealed. Other beans are canned in brine.

The Lethbridge facility currently uses a stationary retort that doesn’t shake or move in the canning process, but the facility intends to replace the stationary retort with a state-of-the-art rotary retort similar to what the industry uses for constant motion for better heat dis-
The researchers also measure drained weight to ensure that the solids in the can amount to 60 per cent by weight of the can’s contents, and texture by using a machine that correlates with chewing.

Balasubramanian said that the prairie provinces and Ontario, which supply bean lines for the trials, have committees that decide which lines should be recommended for registration as cultivars in Canada.

“We look at the canning quality of the lines, and how consistently they performed across the environment,” he added. “All of the experimental lines are compared to the check cultivar that has a large market share.”

What the scientists found is that there are some bean cultivars that are more prone to developing hard seed, which is highly influenced by the environmental conditions. Balasubramanian said that last year in Ontario there was one location that consistently resulted in hard seed for all bean lines grown in that location regardless of market class, but it was just that one year and that single location.

Balasubramanian said that they were unable to pinpoint the reason for the consistent hard seed in the one location last year, but another project recently received approval that will further explore the cause of hard seeds in Ontario-grown navy beans for the Ontario Bean Growers.

Balasubramanian is leading a second sub-activity under the Dry Bean Improvement for Sustainable Production in Canada research project to develop early maturing lines with improved disease resistance. This project’s overview states that dry bean cultivars of six (pinto, great northern, yellow, black, red and pink) bean market classes are grown in rotation with cereal, oilseed, potato, sugar beet and forage crops primarily under irrigation. The days to maturity of dry bean cultivars range from 100 to 105 days in Alberta, which has a short growing season on the prairies.

A major impediment to dry bean production is the lack of early maturing dry bean cultivars with adequate level of resistance to the most prevalent diseases including white mould and common bacterial blight. Development of disease resistant cultivars is one of the most effective and environmentally sustainable methods for reducing yield losses and promoting stable crop production.

White mould is the most important disease constraint for bean growers in Alberta and common bacterial blight is a seed-borne disease.

“We evaluate all of our bean lines for white mould resistance,” Balasubramanian said. “White mould is associated with high moisture and nitrogen. From a breeding standpoint, we’ve identified dry bean lines with better tolerance for white mould.”

In 2014, a pinto bean cultivar called AAC Burdett was registered as a result of the project. Balasubramanian said it is one of the pinto bean cultivars with the best tolerance for white mould, and Viterra has the commercialization rights to it.

He added that through the project, a bacterial blight-resistant black bean line was registered last year as AAC Black Diamond 2 and the research team is in the process of transferring the resistance to other market classes. Currently there are experimental lines in pinto, Great Northern and red bean market classes with resistance to blight.

Balasubramanian added: “It is because of funding from Alberta Pulse Growers, Viterra, Alberta Crop Industry Development Fund, Alberta Innovates – Bio Solutions and AAFC, that we are doing the work that we are doing to grow beans in Alberta.”
The Alberta Pulse Growers (APG) and Saskatchewan Pulse Growers (SPG) have re-launched the Feed Pea Benchmark with additional feed ingredient comparisons for Alberta, Saskatchewan and Manitoba.

“We are pleased to re-launch the Feed Pea Benchmark with updated information current to today’s feed rations,” said APG Chair Allison Ammeter. “This is a good tool for the marketplace and growers who are looking at a feed option for their field peas.”

The benchmark prices are intended for use as a pricing reference for buyers and sellers of feed peas by providing an indication of the “feeding value” of peas.

“The prices represent the point at which peas start to become an economically feasible feed ingredient for swine,” explained Tim Wiens, Chair of SPG. “The reason swine is used to determine the benchmark is because most of the peas that go to feed markets in Western Canada end up in swine diets.”

The Feed Pea Benchmark provides a consistent, unbiased estimate of the feeding value of dry peas in Central Alberta (Red Deer & area), Central Saskatchewan (Saskatoon & area) and Southern Manitoba (Winnipeg & area), based on the value of competing feed ingredients in swine rations. Feed peas trade at various differentials to the benchmark based on local supply/demand, quality differences and other contract terms.

Bi-weekly, tradable prices of the major feed ingredients are collected for the three regions. These prices are then entered into a least cost feed formulation that is typical for grower-finisher swine in Western Canada. A feeding value is then derived for feed peas based on their nutritional characteristics and the prices of the other competing feed ingredients. The least cost feed formulation was reviewed with the assistance of Gibson Capital in consultation with the Prairie Swine Centre and Gowans Feed Consulting.

The Feed Pea Benchmark will be posted every two weeks at www.pulse.ab.ca and www.saskpulse.com, and made available in APG’s bi-weekly e-newsletter Pulse Check and SPG’s monthly Pulse Market Report.

Email rpeterson@pulse.ab.ca to receive the Pulse Check e-newsletter, including Feed Pea Benchmark, in your inbox every two weeks.

### Feed Pea Benchmark Bi Weekly Report - June 6 to 10, 2015

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- All prices are in Canadian dollars per metric tonne.

**What is the feed pea benchmark?**
The feed pea benchmark is intended to be used as a pricing reference. This benchmark provides a consistent and unbiased estimate of the feeding value of peas in the three regions shown. Feed peas will trade at various differentials to the benchmark based on local supply/demand, quality differences and other contract terms.

**How is it calculated?**
The feed pea benchmark is an estimate of the feeding value of dry peas in Western Canada, based on the value of competing feed ingredients in swine rations. Bi-weekly, tradable prices for the major feed ingredients are collected for the three regions shown above. These prices are then entered into a least cost feed formulation that is typical for grower-finisher swine in Western Canada. A feeding value is then derived for feed peas based on their nutritional characteristics and the prices of the competing feed ingredients. The least cost feed formulation was developed in consultation with the Prairie Swine Centre. In addition to the feed ingredients shown above, the feed formulation also includes canola oil, synthetic lysine, synthetic methionine, synthetic threonine, synthetic tryptophan, mono-dicalcium phosphate, limestone, salt, vitamins and minerals.

For more information, please contact:
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office@pulse.ab.ca

For funding information, please contact:
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Funding for the calculation and distribution of the Feed Pea Benchmark Bi-weekly Report is provided by Alberta Pulse Growers and Saskatchewan Pulse Growers.
The ascochyta blight complex is an important field pea disease that occurs in virtually every pea field each year. The blight's lesions reduce optimal leaf and stem area required for maximum photosynthetic activity, leading to reduced grade and productivity. When an epidemic establishes itself early, considerable seed yield loss can occur. Infected crop residue is the primary source of infection and airborne disease spores can travel a considerable distance. Given that several areas of the province received higher than average moisture conditions in recent years, the blight will have established itself at a heightened level in certain regions of the province. Fields seeded to pea in recent years require extra scouting diligence.

The *Mycosphaerella pinodes* species of the complex causes the most economic damage. Ascospores are produced via *Mycosphaerella* spore development on previous crop residue which spread to nearby plants via rain splash or are wind-blown for several kilometres. Frequent showers favour the blight and humid conditions in the lower canopy can lead to symptoms showing up on lower leaves, branches and the stem. Initial symptoms appear as small, purplish-brown spots or flecks, which may enlarge and coalesce, potentially covering an entire leaf. Severe symptoms can lead to foot rot manifesting itself as stem girdling near the soil, leading to lodging and harvest difficulty. Prolonged moist conditions or lodging can cause symptoms to develop on pods. These symptoms may become extensive and lead to early pod dry-down causing seed quality loss in the form of small, shrunked or discoloured seeds.

There are no field pea varieties available with "good" resistance to this disease. Most varieties have "fair" resistance and a couple have "poor". Fungicides can be effective if applied at the early flowering stage, however, thorough canopy penetration and good leaf coverage are essential. Begin scouting at the early vegetative stage and continue into the early flower stage to realize if symptoms are moving upward in the plant canopy. If symptoms don't move higher than the lower one third of the canopy by the flowering stage, large yield losses are not expected. A fungicide application may be necessary if the following conditions are present:

- the crop canopy thickness is moderate to heavy,
- 50 per cent of the bottom 1/3 of the canopy has symptoms and the symptoms appear to be moving into the middle 1/3 of the canopy;
- the weather has been humid and rain is in the forecast; and
- high yield is expected, justifying fungicide cost.

The field pea ascochyta scoring system developed by Ken Lopetinsky and Sheri Strydhorst is a helpful tool to determine whether a fungicide application is necessary. It appears below and on APG’s website.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Estimation Risk Scale</th>
<th>Prediction Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thin 0</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>1. Crop canopy</td>
<td>Moderate 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mod/Heavy 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heavy 30</td>
<td></td>
</tr>
<tr>
<td>2. Leaf</td>
<td>None 0</td>
<td></td>
</tr>
<tr>
<td>Wetness/humidity/dew at noon</td>
<td>Low 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moderate 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High 40</td>
<td></td>
</tr>
<tr>
<td>3. Percent of plants (crop), showing symptoms</td>
<td>None 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low (&lt;20%) 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moderate (20-50%) 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High (50-100%) 40</td>
<td></td>
</tr>
<tr>
<td>4. 5 day weather forecast</td>
<td>Dry 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unset 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Showers 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wet 20</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL**

The estimated risk value is $1+2+3+4=\text{estimated risk value}$. If the estimated risk value is less than 65, no fungicide application is deemed necessary, but field inspections should continue on a bi-weekly basis. If the estimated risk value is +65, the fungicide spray application is recommended.  

*Source: K. J. Lopetinsky and S. Strydhorst, 2002*
### Alberta Pulse Growers 2015
#### Summer Events Schedule

<table>
<thead>
<tr>
<th>JULY</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Event</td>
<td>Location</td>
<td>Contact Information</td>
</tr>
<tr>
<td>July 16</td>
<td>Alberta Ag Crop Walk</td>
<td>Killam</td>
<td>To register: Kelly 780-674-8268 or <a href="mailto:kelly.kelly@gov.ab.ca">kelly.kelly@gov.ab.ca</a></td>
</tr>
<tr>
<td>July 21</td>
<td>Alberta Ag Pulse Crop Walk (9-11 am)</td>
<td>Vegreville</td>
<td>To register: Kelly 780-674-8268 or <a href="mailto:kelly.kelly@gov.ab.ca">kelly.kelly@gov.ab.ca</a></td>
</tr>
<tr>
<td>July 22</td>
<td>Farming Smarter Field Day</td>
<td>Medicine Hat</td>
<td><a href="mailto:jamie@farmingsmarter.com">jamie@farmingsmarter.com</a> or <a href="http://www.farmingsmarter.com">www.farmingsmarter.com</a></td>
</tr>
<tr>
<td>July 22</td>
<td>Alberta Ag Pulse Crop Walk (9-11 am)</td>
<td>Bon Accord</td>
<td>To register: Kelly 780-674-8268 or <a href="mailto:kelly.kelly@gov.ab.ca">kelly.kelly@gov.ab.ca</a></td>
</tr>
<tr>
<td>July 23</td>
<td>Alberta Ag Pulse Crop Walk (9-11 am)</td>
<td>Barrhead</td>
<td>To register: Kelly 780-674-8268 or <a href="mailto:kelly.kelly@gov.ab.ca">kelly.kelly@gov.ab.ca</a></td>
</tr>
<tr>
<td>July 28</td>
<td>BRRG Stettler Field Site Tours</td>
<td>Stettler</td>
<td>BRRG: 780-582-7308</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUGUST</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Event</td>
<td>Location</td>
<td>Contact Information</td>
</tr>
<tr>
<td>August 6</td>
<td>BRRG Forestburg Field Site Tours</td>
<td>Forestburg</td>
<td>BRRG: 780-582-7308</td>
</tr>
<tr>
<td>August 7 &amp; 8</td>
<td>MARA Agricultural Fair (Field Tours)</td>
<td>Fort Vermilion</td>
<td>MARA: 780-927-3776</td>
</tr>
<tr>
<td>August 11</td>
<td>Alberta Ag Crop Walk</td>
<td>Killam</td>
<td>To register: Kelly 780-674-8268 or <a href="mailto:kelly.kelly@gov.ab.ca">kelly.kelly@gov.ab.ca</a></td>
</tr>
</tbody>
</table>

Please note that this schedule includes details that were available at the time *Pulse Crop News* went to press. For more information and up-to-date details, please visit the Calendar of Events at [www.pulse.ab.ca/producers](http://www.pulse.ab.ca/producers)

Thousands of children picked up a sought-after pea pen and felt the difference between split peas, lentils, dry beans and chickpeas grown in Alberta at Aggie Days in Calgary in April. Many of the parents and older children were excited to see that pulses could be used in great-tasting desserts and other delicious recipes.
The Alberta Seed Processors, also known as the Association of Alberta Co-op Seed Cleaning Plants, is in the process of upgrading many of its 67 plants across the province, including some improvements that specifically help pulse growers.

“We have seen a trend for the plants handling larger volumes of pulse crops to invest in equipment that is pulse friendly,” said General Manager Monica Klaas of the Alberta Seed Processors or Association of Alberta Co-op Seed Cleaning Plants. “Seed health is one of our first concerns and we recognize that many pulse crops are prone to cracking if handled incorrectly. A lot of our plants that are handling a large volume of pulse crops have invested in things like bean ladders and conveyors so that we’re looking after the integrity of the seed as well as cleaning it. Pulses are a large seed and they get put through a variety of machinery so it’s best if we have equipment that’s gentle on them. If you are a grower in a traditional pulse crop area, most of the plants will have that specialty equipment.”

Klaas said that it is very important for pulse growers to talk to their local plant managers before harvest so that the seed can be scheduled for cleaning as soon as it is harvested.

“It’s a matter of looking after the integrity of the seed,” she explained. “It isn’t only a pulse issue, but can affect pulses more than other grains. When it is really cold, lots of plants don’t like to process pulses because they can break. Many plants like to clean off the combine. One of the challenges with handling pulse crops is the scheduling.”

Members of the association also invested $17 million over the last three years in plant upgrades like larger digital scales and colour-sorting technology. Two brand new, state of the art facilities were recently built in Alberta and several more are planned over the next few years, Klaas said.

“The co-ops have planned for success in upgrading and building, and that’s very exciting,” she added. “I think it shows that the growers of Alberta are committed to using the best seed possible.”

The association was formed more than 60 years ago with the goal of establishing seed cleaning plants across the province, initially as part of a weed control program. Last year, the association’s 67 member plants processed 39 million bushels, including close to 500,000 bushels of pulses, which were primarily field peas. Each plant is a cooperative run by a board of directors and a manager.

“Our mandate is to provide growers with the best seed possible,” Klaas said. “Our member plants clean both common and pedigreed seed, depending on the plant. Most of our members supply services in which seed samples are submitted to seed labs on behalf of the grower.

The association website at http://www.seed.ab.ca/seedprocessors.html lists which plants clean pedigreed and common seed. Some of the member plants offer seed treating services and inoculants, while a few offer international marketing services. The Alberta Seed Guide, published twice a year, also contains information on member plants.

“Our core business is seed cleaning,” Klaas said. “However, some co-op boards of directors have explored business diversification models like rail car loading and exporting. For some of the co-ops, diversification has become key to their success.”

Klaas explained that if a grower is using seed that he grew on his own farm then the seed plant would clean it and the seed would go back on the grower’s truck to his own farm because that’s the legal process for common seed in Canada. If it’s a seed grower who has pedigreed seed, then either he would take it home and sell it to his customers or, in some cases, the association’s seed cleaning co-ops have storage bins on site and act as a distribution agent on behalf of the seed grower.

Klaas said that the association will be making some changes as a result of the passage of plant breeders’ rights (PBR) legislation earlier this year.

The amendments found in Bill C-18, An Act to Amend Certain Acts Relating to Agriculture and Agri-Food (Canadian Agricultural Growth Act), aligned PBR with the 1991 Convention of the International Union for the Protection of New Plant Varieties (UPOV). It offers opportunities for increased investment and delivery of new varieties from plant breeders operating in and outside of Canada, as well as ensuring that farmers have access to new...
A tiny tart packing a nutritious punch with pulses allowed a trio of University of Alberta Nutrition and Food Science students to declare their mission accomplished, at least until the national competition.

Andrea Roman, Kaixing Tang and Minghua Yu won first place at the 7th annual Alberta MISSION: IMPULSEIBLE product development competition with the Peamon Tart, which secured them a spot at the national competition in June.

“We were really excited about winning because we had so much fun participating and creating our product,” Roman said, adding that she drew inspiration from working with pulse crops last summer. “Participating in MISSION: IMPULSEIBLE was a great platform for us to learn more about the versatility of pulses and product development.”

The Alberta Pulse Growers’ MISSION: IMPULSEIBLE is a food product development contest for post-secondary students. The mission for the 2015 contest was to create an innovative food product to help present pulses to the world and build awareness of the 2016 International Year of Pulses.

The team created the dessert with a tart shell made from a mixture of canned, red kidney beans, chickpeas, Romano beans and great northern white beans. They substituted the eggs in the lemon filling with a protein substitute that the team developed from pea protein. They called the egg substitute Peggs, and it generated a lot of interest from the 50 or so food enthusiasts and promoters who attended the provincial competition at Ernest’s Dining Room at NAIT in March.

In addition to a monetary prize of $1,500, the team won the opportunity to work with Alberta Agriculture and Forestry’s Food Processing Development Centre in Leduc to scale up their product for the national competition to take place on June 23 at the Pulse and Special Crops Convention in Calgary.

“With regard to the formulation, we are still working on optimizing the taste and texture,” Roman said of the team’s effort to scale up the Peamon Tart. “We also have some new ideas regarding packaging and some creative new changes to our product that we think will make a good surprise for the national competition.”

Troy Sturzenegger is a Food Scientist with Alberta Agriculture and Forestry and has been working with the trio to upscale the Peamon Tart for the national event, including developing a...
tart with a different flavoured filling for different markets.

“It’s great to see new ideas coming out,” said Sturzenegger, who has worked with the winners of the last three Alberta MISSION: IMPULSEIBLE competitions. “The goal is to produce a great product that will be commercially viable in the future.”

The winners of regional competitions across the country will compete for prizes including a top prize of $2,500 at nationals.

“We are looking forward to meeting other groups and trying some of their delicious creations for the national competition,” Roman added. “We have seen some of the products on the MISSION: IMPULSEIBLE website and they look so interesting and delicious. Overall, we are very excited to continue to experiment and perfect our product and hope (the national judges) will love it as much as we do.”

APG’s Food and Nutrition Coordinator, Debra McLennan, was excited about all of the student products entered in the provincial contest.

“They all tasted great,” she said. “It boiled down to not only what the judges thought, but also what the audience enjoyed the most. The Peamon Tart was a tasty treat. It was quite innovative and something we haven’t really seen in the market to date. I’m hoping that Alberta can bring home the national win again. I think we have good chance because the Peamon Tart team has a good presentation and is very personable with a great product that is gluten-free and egg-free.”

Second place in the provincial competition and a $1,000 prize went to the U of A’s Min Lin, Cheng Shi, Shihao Wei and Stephanie Nash with the Chickpea Nugget, which is a pulse-based nugget made from chickpeas. Judges and audience voting put Chau Chin Yo, Teresa Leong, Carmen Dam and Judy Kimotho (also from the U of A) in third place with a $500 prize for the Pulscotti Spread, which is a gluten-free, nut-free and dairy-free cookie butter made from chickpea flour.

Judges for this year’s Alberta competition were: Marilynn Boehm of the Alberta Food Processors Association; Kevin Johnson from Freson Bros.; Registered Dietitian Katherine Ng; and Jay Han from the Food Processing Development Centre.

MISSION: IMPULSEIBLE was made possible by financial support from the Alberta Pulse Growers and Alberta Innovates Bio Solutions, as well as partnerships with the Food Processing Development Centre, Pulse Canada, and NAIT Culinary Arts program.

In 2014, Alberta’s provincial winner went on to win the national competition with their frozen Pulse Pop, which is composed of chickpeas, pea butter and soy nuts wrapped with black bean and cacao, then rolled in chocolate and coconut.

Alberta post-secondary students interested in competing in Alberta’s next MISSION: IMPULSEIBLE are invited to email McLennan for information at debramc@pulse.ab.ca.
Continued from page 35

and improved varieties developed in
Canada and internationally.

“The association sought legal advice
for a grower declaration stating that
the seed was legally produced on the
grower’s farm, and the grower intends
to use the seed solely on his own prop-
erty or property he has control of, and
the use of the seed will not contravene
Plant Breeder’s Rights, nor any other
laws or contract,” Klaas said. “The
new proposed use of the declaration
form is designed to ensure all parties
involved understand and follow the
new legislation.”

She added that grower declarations
aren’t anything new in the ag business
with cereal producers already signing
declarations to market crops, but dec-
larations could be new for the seed
industry.

“The seed processor - or the middle
man - wasn’t really implicated under
the old rules,” Klaas explained. “Un-
der the new rules, there’s specific
wording saying a seed cleaner, a
trucker, a retailer or anyone who helps
the grower with any illegal handling
of plant breeder’s rights is liable. It’s
something we take very seriously. In
the past, we’ve always recognized
plant breeders’ rights, but with new
legislation, it’s time to update our path
forward as well.”

Klaas said that the goal is to have the
declarations ready for each plant to
use by the start of the crop year on Au-
gust 1. However, each facility is run by
an individual board of directors which
ultimately has the power to adopt or
reject the use of the declaration.

“The view of the UPOV rule is that it’s
good for Canadian agriculture, there-
fore it’s good for the seed cleaning
coop and the members,” said Klaas,
who is also an agrologist. “As with any
regulation change, there’s always a
little trepidation. Basically, contraven-
ing plant breeder’s rights, is stealing
intellectual property. Our association’s
stance is that this is federal legislation
and international rules, and we are
absolutely going to educate our mem-
ers on how to follow the rules.”

Feature Pulse Recipe: Black Bean Antojito

This delicious wrap does not require cooking making it a welcome meal on a hot summer day, whether as a supper or picnic
lunch. This is one of the many new recipes featured in the new Pulses: Cooking with beans, peas, lentils and chickpeas
cookbook available from Alberta Pulse Growers.

Servings: 8 wraps

Ingredients:
• 1 (19 oz/540 mL) can black beans, rinsed and drained
• 2 garlic cloves, minced
• juice of 1 lime
• 1 tsp (5 mL) cumin
• 1 tsp (5 mL) coriander
• ¼ tsp (1 mL) salt
• ¼ tsp (1 mL) ground black pepper
• 8 (6 inch/15 cm) whole wheat flour
tortillas
• 3 red peppers, roasted, skinned
and sliced
• 1 avocado, pitted and sliced
• 1 cup (250 mL) shredded cheddar
cheese

Directions:
1. In a large bowl, mash beans and garlic
with a fork or potato masher. Add lime
juice, cumin, coriander, salt and pep-
per. Divide into 8 parts.

2. Spread mashed bean mixture evenly
ever each tortilla. Divide roasted red
peppers, avocado, and cheese evenly
between each tortilla.

3. Roll the tortilla. Wrap in plastic wrap
tightly and let cool in refrigerator for 10
minutes to overnight.

4. Cut each roll into 1 inch (2.5 cm) pie-
ces. Enjoy as is or with a sour cream dip.
Delaro™ fungicide doesn’t take kindly to diseases like anthracnose, ascochyta and white mould threatening the yield potential of innocent pulse and soybean crops. Powerful, long-lasting disease control with exceptional yield protection, Delaro is setting a new standard in pulse and soybean crops.

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