

January 2019

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Leveraging Grower Dollars with Canadian Agricultural Partnership Research Funding

*SPG is leveraging nearly \$17 million
to support pulse and soybean research*

Root Rots on the Prairies

*Latest survey results show root rots
still causing problems for pulses*

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*Researchers are putting pulse protein
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Chair's Message

Investment into pulse breeding during times of excess still important for growers

BY COREY LOESSIN



THERE IS A LEGITIMATE QUESTION TO BE ASKED about investing in plant breeding during times of production surplus. No question the loss of the Indian market for pulse crops has left the world pulse market with more than ample supply. Prices are down, movement is restricted, and some wonder 'why keep spending money to develop better varieties when we cannot sell what we grow now?'

Not that I or anyone necessarily has the right answer, but there are a couple points of view around this question that we have identified. One is that a plant breeding program is a long term endeavour. We have been fortunate for more than 20 years to have a partnership with the Crop Development Centre (CDC) that has created excellent varieties of peas, lentils, chickpeas, beans, and faba beans. Were

it not for the talented team at CDC, and for the large grower investment over the years, we may not have reached the level of success in the pulse industry that we have. Now market conditions have changed, and while there are still markets, India's absence as a major importer is causing stocks to build. Does that mean investment and support for a program that has taken decades to build should cease? If that was to happen, it is unlikely that it could be restarted again when market conditions are more favourable. Long-term program success is not an on/off switch.

The plant breeding program is also not just focused on increasing yield. Disease resistance in particular is a focus with outcomes that can directly benefit growers by making production more efficient. Looking back to the development of powdery mildew resistance in peas for example, it was a development that made pea production in Saskatchewan more stable without any additional inputs. Another example looking forward, is the anticipation of *Aphanomyces* resistance being part of new pea varieties. If and when this is possible, pea producers will have a new ability to stabilize production, even when conditions are more adverse. Root disease is currently a widespread threat to production, with a somewhat unpredictable effect on crop outcome depending on the growing season conditions. Some level of resistance in varieties would lend more predictability to production, hence more efficiency, without additional inputs.

When demand is low, it too is not the time to put a halt to market development. Market development work is important to build diverse demand for products we produce at home and abroad. There is no quick fix to help boost domestic demand enough that will replace a large international market. It takes a lot of time, effort, and resources to help create new market demand. In times of surplus production, it cannot come soon enough.

It may seem counterintuitive to continue with breeding investment when production is overwhelming demand. Due to the long-term nature of the endeavour, and the prospect that developments can make production more efficient, I would suggest it is still the right course of action. Adjustments can be made along the way, but the goal of a stable, profitable pulse industry is still valid. Research and breeding investment is part of reaching for that goal.

With CropSphere and Winter Regional Pulse Meetings coming early this year, I invite you to come and engage with us at these events and share your thoughts.

Sincerely,

A handwritten signature in black ink, appearing to read 'Corey Loessin', with a long horizontal stroke extending to the right.

Corey Loessin
Chair

Executive Director's Message

Market access, drought, and neonicotinoid review process made for a tough 2018 growing season

BY CARL POTTS



TO SAY THAT 2018 WAS ONE OF MOST CHALLENGING YEARS in Saskatchewan pulse production history is an understatement. We saw strong pulse crops in some areas, while other parts of the province were hampered by drought. The pulse industry was challenged by market restrictions placed on crop exports by India, beginning early on with discontinuation of the fumigation exemptions of pulses into India, followed by the Indian pulse market closing its doors to imports through tariffs on peas, lentils, and chickpeas. While the Canadian pulse industry is working closely with the Canadian government to resolve market access issues, at home we are facing regulatory changes like the proposed de-registration of neonicotinoids by Canada's Pest Management Regulatory Agency (PMRA).

India continues to create challenges for pulse exports, with imports stalled due to fumigation requirements and protective tariffs in place. In February, Prime Ministers Modi and Trudeau committed to work together on the fumigation requirements that India had applied to Canadian pulse imports, and to come a resolution on unworkable regulations. Pulse Canada and the Canadian pulse trade hosted delegates from the Government of India in September to evaluate Canada's systems approach. You can read more about this visit on page 42.

In late 2017, the pulse industry was asked to submit data to the PMRA in support of a science-based, thorough assessment of neonicotinoids. PMRA has been re-evaluating the registration of three particular products — imidacloprid, clothianidin, and thiamethoxam. Maintaining access to these products for pulse growers is vitally important. There are very few products available that provide protection against insect pests in peas, lentils, and chickpeas. Saskatchewan Pulse Growers has been involved in the PMRA review and consultation process alongside Alberta Pulse Growers and Pulse Canada, to ensure that PMRA has access to sound, Prairie-specific data on those products. We will continue to work with these groups to ensure that the pulse industry's voice continues to be heard.

As difficult as the 2018 crop year was, growers are already looking forward to a new year of crop planning and decisions to be made. I want to invite pulse growers from across the province to all of the extension events happening throughout the winter months. Our annual general meeting and CropSphere 2019 are quickly approaching, and our annual Winter Regional Pulse Meetings will be happening at the beginning of February again.

We will be covering kochia and root rot at these events, which continue to pose significant problems for Saskatchewan pulse crops. We will also be discussing our emphasis on pulse market development, including a focus on ingredient and pet food processing. CropSphere will feature a panel discussion from the members of the Keep it Clean campaign, an initiative we are a part of through Pulse Canada, alongside Cereals Canada and the Canola Council of Canada. The session will be focused on communicating and monitoring maximum residue limits and market risks that arise from the use of crop protection products. Both events are geared to give pulse producers tools they can use on their farms, so be sure to mark the dates in your calendar. I look forward to connecting with you at these events.

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One Pulse, Two Pulse, Three Pulse, More



Recent research paints an interesting and complex picture of what makes a sustainable rotation

BY LINDSEY SMITH

IF SOME PULSES IN ROTATION IS GOOD then more pulses is better, right? As with most agronomic questions, it depends.

Agriculture and Agri-Food Canada research scientist Dr. Yantai Gan has been leading a complex, multi-site, multi-year project searching for answers on the impact of several pulse crops in a four-year rotation, what changes if you change the pulse species, and how pulse crops in rotation shift the soil and root microbial ecosystems to the good or bad.

Previous work has spelled out the rooting depth/water use relationship with pulse crops in rotation, Gan explains, as pulses are known for being shallow rooted, leaving water at deeper soil layers for future crops to access. Also, pulse crops leave nitrogen-rich residues (straw and roots) behind that benefit subsequent non-pulse crops, but what else do pulse crops do to influence soil biology and crop yields in the following year or years?

"Our research shows that about 30 per cent of the yield advantage in a subsequent wheat crop is due to the nitrogen and water-use impact of the preceding pulse crop," Gan says. "What contributes to the other 70 per cent of the yield benefit?"

The answer lives within changes in population of microbes within the root, on the root surface (rhizosphere), as well as in the rooting zone (soil).

Comparing a one pulse in four years rotation, to two-in-four, and three-in-four year rotation, Gan and collaborators measured typical agronomic performance, such as yield of both the pulse and non-pulse crops. They also analyzed the roots and the soil that adhered on the root surface by brushing the soil from the roots to collect samples.

What science is just beginning to identify, isolate, and quantify, are the millions of fungal, bacterial, and mycorrhizae species

living within soil. Taking it one step further, research is looking at understanding how these fungi, bacteria, and mycorrhizae interact with crop roots growing in the soil, soil environments, and cropping practices.

Unlocking some of these answers is actually quite key to establishing sustainable pulse crop rotations. As Gan explains, research suggests that a diverse four- to six-year crop rotation that includes two or more pulse crops is beneficial — but we also know that fungal pathogens that cause root rot diseases of pulse crops begin to increase in the soil, if host crops are grown too closely in rotation.

That said, some of the pulse species have the capacity to build up antagonistic bacteria in the soil, Gan says. While perhaps counterintuitive, in dry conditions and climates, those antagonistic bacteria naturally fight off fungal pathogens, he says. Such is the case with a lentil-durum



Pea roots showing plenty of healthy, nitrogen-fixing nodules after being included in a diverse rotation including canola, cereals, and at least one other type of pulse crop.

alternate-year rotation grown near Swift Current since 1979 — the level of soil fungal pathogens of lentils are actually kept in check because of antagonistic bacteria that thrive in a root zone that includes a lentil crop every second year.

In relation to this on-going study, Gan says results are just as clear in wetter conditions. Plots at Indian Head showed very dramatically that where pulse root rots are of a real concern, adding more pulses in rotation resulted in devastating levels of root rot in peas.

The very notion of sustainability as it relates to pulse rotations is finding that balance of the soil-feeding and flourishing aspects

of adding one, two, or more pulses in a four- to six-year rotation, against the very real possibility of encouraging pathogens to multiply. Ultimately, what is sustainable — which includes economic considerations — will rest squarely on climatic conditions in conjunction with diverse rotations.

Gan's research shows that pea yields benefit most from a diverse rotation that includes canola, cereals, and perhaps one other type of pulse, especially in those areas where higher moisture is expected.

And what about those beneficial antagonistic bacteria in a lentil/durum rotation? Could the future include a time when we inoculate pulses with nitrogen-

fixing species plus antagonistic bacteria? Gan says that laboratory and greenhouse-based research has proved promising, and that field trials will be conducted in 2019 to test the most effective antagonistic bacteria they have identified. Understanding and identifying those soil microbes that can be either friend or foe is quite complex. ●

Lyndsey Smith writes from the Ottawa Valley. Find her across social media platforms as @realloudlyndsey

Leveraging Grower Dollars with Canadian Agricultural Partnership Research Funding

SPG is leveraging nearly \$17 million to support pulse and soybean research

BY NOELLE CHORNEY

SASKATCHEWAN PULSE GROWERS

can substantially multiply their research investment dollars by leveraging resources from the five-year Canadian Agricultural Partnership (CAP) initiative, which is ready to invest \$388 million into Saskatchewan's agriculture sector.

The partnership between Saskatchewan Pulse Growers (SPG) and CAP is set to expand knowledge from genetics to crop management to market diversification. Wherever SPG and CAP strategic directions meet, there are opportunities to leverage growers' investment in research that will show direct benefit in the field.

SPG Executive Director Carl Potts says, "Research is an important part of what we do. Sixty per cent of our budget goes to research and that funding is primarily from farmers."

SPG is investing \$2.1 million over five years into pulse and soybean research in partnership with CAP, through the Agri-Science Program. Pulse and soybean related CAP projects with SPG support receive close to \$17 million in additional funding from government and industry groups. "For every dollar we put in, we are leveraging eight dollars from government and other industry partners," says Potts.

Three research clusters have specific relevance to Saskatchewan Pulse Growers, and several projects are getting underway:

Integrated Crop Agronomy

The Integrated Crop Agronomy (ICA) cluster, led by the Western Grains Research Foundation focuses on resiliency to climate change and other threats including weed, insect, and disease threats, to continue to improve production levels and maintain global competitiveness in the face of climate change. SPG Research Project Manager Allison Fletcher says, "The ICA Cluster is

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taking a systems approach to these projects in order to address farmers' reality — they are growing multiple crops in rotation. The ICA Cluster has a multi-commodity, Western Canadian focus."

Two projects will focus on monitoring field crop insect pests and prairie crop diseases across the entire Prairie region. Coordinated efforts among scientists, agronomists, and producers will gather and share data about insect crop pests and crop diseases. The data will be used to create tools for producers, agronomists, and industry partners to develop integrated pest management strategies and to plan for following years.

While the crop insect pests program is the continuation of the current Prairie Pest Monitoring Network, the intended integration across provinces would be new for prairie crop diseases.

A third project supported by SPG focuses on the effects of spray drift. With changes to crop rotations, the introduction of new chemical formulations, and increasing crop diversity, there are new gaps in understanding regarding the impact of high-clearance sprayers and potential spray drift. This project will create models that predict effects on selected crops in field conditions, to help producers and agronomists further understand the potential issues related to spray drift.

Canadian Field Crop Research Alliance Soybean Cluster

In partnership with the Canadian Field Crop Research Alliance, several studies are underway that cover themes related to soybean production on the Prairies, from genetic improvement, to expanding the growing range and increasing disease resistance, to advancements in processing.

Fletcher says, "We are focusing on the adaptation of soybeans in order to improve the crops' suitability to Saskatchewan's environment. We want to support research that will help expand the area of adaptation to regions north and west of where

"For every dollar we put in, we are leveraging eight dollars from government and other industry partners," says Potts.

soybeans have traditionally been grown, and this includes genetics, pests, and diseases."

The research projects will focus on breeding of short-season, food-type soybeans to expand their range into northern latitudes, helping them beat the cold while also meeting protein meal standards.

Management of root rot is another focus of two other research projects, to help producers identify disease symptoms, manage soybean diseases, and maintain yields.

Pulse Cluster

"The Pulse Cluster aims to improve the quality of pulse crop varieties, increase pulse yields, and increase consumption and utilization of pulses," says SPG Pulse Science Cluster Program Manager Dr. Constance Chiremba.

Three themes will be covered by the CAP-funded research projects focused on pulses:

Improving productivity of new and established pulse crops

Two projects are funded under the CAP program related to improving pulse crop productivity, both focused on developing genetically improved pea varieties with higher quality protein, resistant starch (less digestible starch, which acts more like soluble fibre than carbohydrates), and a higher resistance to root rot.

Addressing pest threats while reducing reliance on pesticides

A project committed to "vigilance towards plant nematodes to sustain pulse production in the Canadian prairies" falls under the theme of reducing pest threats. Plant nematodes can cause yield decline and nematode infestations may prevent access to new markets. The research will lead to outreach products that inform growers about nematodes, how they may affect their pulse crops, field symptoms to identify, and control methods.

Innovations in pulse ingredient processing

A variety of projects related to food processing and product development will be funded under the CAP program. One research team will focus on developing processing strategies for innovative, commercially-ready pulse ingredients to expand markets. Another project team will focus on energy- and cost-efficient removal of anti-nutritional compounds and undesirable flavours in pulses, to make pulse ingredients more functional and palatable. Additionally, a third research team will focus on strategic approaches for value-added processes and uses for faba beans, while another will explore the use of pulse-based ingredients to develop low glycemic pet food.

A Greater Impact for Producers

"Our research focuses on all aspects of crop production, from breeding to field management, to processing and market diversification. All of these are important to farmers, and we are doing our best to make farmers' investment in pulses and soybeans go farther," says Potts. •

Noelle Chorney is a freelance science writer, interpretive planner, content manager, and owner of Tall Order Communications. She can be reached at tallorder@sasktel.net



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Dry Bean Intrigue



New varieties are
helping to expand
this crop's appeal

BY KIM WAALDERBOS

**DRY BEANS HAVE BEEN
PREDOMINANTLY GROWN** in the irrigated areas near Lake Diefenbaker, with limited acres of dryland production in Saskatchewan.

Now, improved and more readily available varieties may make dry beans a more attractive crop for growers to include in rotations, says Laurie Friesen, Seed Program and Research Project Manager for Saskatchewan Pulse Growers (SPG).

Dry beans comprised 10,000 seeded acres in 2017 across Saskatchewan, up from 7,000 in 2016, according to the Government of Saskatchewan's 2017 Specialty Crop Report. The most popular dry beans grown are pinto beans, followed by navy, black, and small red beans.

The black bean variety CDC Blackstrap has really helped spark interest with growers, says Friesen. Its early maturity and higher pod clearance make it a good fit for both dryland and irrigation production.

"CDC Blackstrap just took off this year," says Dr. Kirstin Bett, Plant Breeder and Professor at the Crop Development Centre with the

University of Saskatchewan. "It was not as difficult to produce as people thought," she adds. The upright structure enabled growers to swath or combine the beans without specialized equipment, and effectively cut plants off at the stems without leaving pods behind in the field.

Jeff Ewen, a Riverhurst farmer and agronomist, hosted an irrigated demonstration plot of CDC Blackstrap on his family farm, E3 Ag Ventures, this year. The Ewen family has been growing dry beans on their 11,000-acre farm for a decade, since they first acquired irrigated land along Lake Diefenbaker. This year, 800 irrigated acres represented their dry bean crop.

Ewen had seen the CDC Blackstrap beans grown in Dr. Bett's research trials on narrow rows and was encouraged enough to try them. "Disease is one of the worst things with dry beans," says Ewen. "I expected when they were packed in tighter row spacings that there would be more disease issues, but it was not the case."

The Ewen family air seeded the black beans at 10.5-inch row spacings in their on-farm

demonstration. "The air seeder damaged seed, resulting in a reduced plant population, and ultimately reduced yield," says Ewen, yet "the economics were very close in comparison to our more traditionally grown black beans on 22-inch rows because we made a lot less passes and required no specialized equipment for seeding and harvesting."

Dr. Bett is focusing her research work on breeding the best narrow-row, straight-cut varieties of dry beans that fit the Saskatchewan climate. Most of her trials are on dryland production because, "if they do well on dryland, they will do well under irrigation," she says. With CDC Blackstrap now available, Dr. Bett is aiming to get other market classes with strong variety choices. Next year, CDC Ray, a Flor de Junio is expected to be available for commercial production. "It looks like another variety to get excited about," she says. "It has a strange growth habit that lends well to straight cutting, too."

The biggest obstacle to expanding dry bean acres in Saskatchewan has been finding varieties that fit a 90 to 105-day maturity range. "Dry beans are an extremely sensitive

crop to frost,” says Ewen. “And they are heat loving, like soybeans.” Dr. Bett has focused on breeding common bean with tepary bean for improved traits, which includes better frost tolerance. This has helped with the increase in dry bean acres in Saskatchewan.

Friesen says the two biggest disease challenges with dry beans are white mould and common bacterial blight. To manage disease, both Friesen and Ewen stress the importance of crop rotation. “The key to getting the result you want starts with your rotation,” Ewen says, adding he rotates cereals, dry beans, flax, and canola. “The biggest danger to dry bean expansion is fitting them around the canola rotation, because of shared diseases in the two crops,” he says. Dr. Bett is also breeding varieties for tolerance to common bacterial blight. So far CDC Blackstrap and CDC WM2 both have tolerance.

“There might be a few growing pains, but as Saskatchewan growers get more familiar with dry beans, they have good potential to be part of the Saskatchewan rotation,” Friesen says. •

Kim Waalderbos is a freelance writer and dairy farmer. She can be reached at kwaalder@gmail.com



Dry bean production is beginning to see an increase in interest by growers across the province.



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Pulse-Flour Bakery Products a Success in the United Kingdom

Collaborative research by Cigi and Warburtons has lead to a deeper understanding of pulse ingredients in bakery products – and positive feedback from retail outlets and consumers

BY NOELLE CHORNEY

IMAGINE A WORLD WHERE BREADS MADE WITH PULSES are as common as breads made with wheat flour. We are not there yet, but the powerhouse team of a grain market development institute and the United Kingdom's (UK) leading independent baker is paving the way for pulse ingredients in bakery products. The Canadian International Grain Institute (Cigi) and Warburtons have partnered to release several new bakery products into UK retail markets, to critical acclaim.

"This partnership has been a great decision for Warburtons," says Program Manager Adam Dyck. "We get to work with a world class organization in the milling, baking, and analytical fields."

While Warburtons first established its relationship with Cigi through Canadian

wheat, pulses are the new frontier when it comes to milling and testing product.

This collaborative relationship between Cigi and Warburtons allowed staff from both organizations to start thinking

about potential synergies between pulse processing research and translating that into bakery products.

The team is deepening basic knowledge and building a database related to processing,





Warburtons wholemeal thins include pulse ingredients which boost the protein levels, something that is resonating with U.K. consumers.

milling, and baking with peas, lentils, chickpeas, and beans. Warburtons has released six new products, including breads, bagels, and flatbreads using different formulations of Canadian pulses. Cigi will continue to transfer the knowledge gained from this project, to the pulse and food industries. In late 2018 Cigi presented at AACC International's annual meeting as well as at the Canadian Pulse Research Workshop, with articles planned for peer-reviewed journals as well.

The research is extremely timely, considering the public's growing interest in healthful foods, with a particular focus on protein. "There is growing global demand for plant-based protein. Inclusion of pulse flours is an elegant way to do so," says Dyck. "We have been able to deliver pulses in a familiar format. Retailers are really supportive of this

innovation, and when we put pulses on the package label, consumers understand that it means they are getting higher protein and fibre." Dyck mentions that Warburtons is seeing a draw of new consumers to their pulse products in the wrapped bread market.

While the team began with specific questions about what pulses could do as flour ingredients in bakery products, "we learned that every pulse type is different. You cannot class peas, lentils, chickpeas, and beans together, even if they are all under the pulse umbrella. Each type has unique functionality, attributes, and flavour. We are looking at all different types, and even specific varieties," says Cigi Project Manager Lindsay Bourré.

Another variable that is being investigated is the effect of pre-fermenting on pulse flours

during the baking process. "There is quite a bit to learn about the actual process. We have now moved on to looking at different formulations using live cultures and how they interact with pulses, which is showing promise. When we add pre-ferments to bread, we notice changes to the quality and flavour properties of the breads. There is a lot of potential for different pulse types," says Bourré.

For all the team has already learned, "we are still in our infancy," says Dyck. "We are still learning a lot about pulses as ingredients. Warburtons has been working on wheat since 1876, and we have only been working with pulses for the last three years. We are just now moving beyond evaluating pulses based on colour, shape, and size, and focusing more on functionality, flavour, and nutritional profiles."

"It is all positive — any time we are talking about new, high value markets for a commodity, it is good news for the grower. We are moving away from referring to pulses as a commodity, and towards thinking of them as ingredients, and that is a higher value market segment," says Dyck.

At this point, the research work is never done. "Even more unanswered questions have arisen from the questions we asked in the first place," says Sopiwnyk. Bourré agrees, "Once you think you have solved something for one pulse, you move on to the next one and learn that there is a whole new set of questions."

"We are grateful to Cigi for what we have accomplished and are able to do today. We have got a lot more work to do. We have opened Pandora's Box for pulses, and we need to keep the momentum growing," says Dyck. •

Noelle Chorney is a freelance science writer, interpretive planner, content manager, and owner of Tall Order Communications. She can be reached at tallorder@sasktel.net

A man wearing a black baseball cap and a plaid shirt stands with his hands in his pockets in front of a large industrial silo. The background shows a cloudy sky and a green field.

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Adding Value to Food Using Pulse Protein



Researchers are putting pulse protein into a variety of end-use products

BY MEGAN MADDEN

AROUND THE WORLD, and right here at home, a shift towards plant-based foods is a trend that is here to stay. A report from Research and Markets forecasts that global demand for plant protein is to expand by 8.3 per cent over the next four years. This is great news for Saskatchewan's pulse growers, and research into new uses for pulses is increasing and getting more creative alongside this demand. Dr. Lingyun Chen, Canada Research Chair in the Department of Agricultural, Food and Nutritional Science at the University of Alberta is currently working with peas, lentils, and faba beans in different formulations for uses in foods that have not traditionally incorporated pulses.

While there have been efforts to develop pulse options in food products such as breads, quick snacks, meats, and pastas — knowledge about pulse protein applications in foods like baked goods, breakfast cereal, and meat analogues is still limited. These foods are being targeted in Dr. Chen's research because combining pulse proteins and cereal proteins can improve nutritional value, as these two kinds of proteins are complementary in essential amino acids.

Dr. Chen's current studies are working to understand how processing conditions like temperature and pressure affect the pulse properties like foaming, and oil/water binding when being incorporated into foods, and to examine how pulse incorporation affects flavour, texture, and baking properties.

"We are examining different methods to extract proteins," says Chen. "Thanks to the Natural Sciences and Engineering Research Council of Canada and Saskatchewan Pulse Growers (SPG), we had our grad student work on different extraction methods. Some methods led to proteins with different structures and compositions with better emulsifying or gelling capacity, which can impact how the protein functions in food."

According to Dr. Chen's research summary from *'Value-added applications of pulse proteins for human foods'* the results suggest that both variety and growth location of the pulses tested, impact protein extraction efficiency (protein recovery) from faba beans and lentils, as well as protein solubility, gelling, water-holding, and emulsifying properties.

Once the proteins are extracted, how does this all translate to actual food? Chen has been testing lentils and faba beans as an egg replacement option in baked goods. "We found that the lentil protein had higher foaming capacity and stability than faba bean protein," she explains. "The lentil protein foaming capacity was comparable to egg whites and were able to replace 100 per cent of egg white protein in muffins and cakes with the lentil protein. In angel food cake we could only get it to 50 per cent replacement, but these tests all demonstrate that the lentil protein can be used in place of eggs." Sensory testing in this research also came out positive — meaning that the flavours and "mouth feel" were comparable to baking with eggs.

Chen is also working to replace eggs and wheat flour by combining barley protein with lentil protein to enrich the protein and fibre nutrition in donuts. This research found that the lentil protein concentrates were efficient as foam stabilizers as well as oil and water binders in the donuts, based on cooking characteristics and physical attributes evaluations.

PAY FOR PROTEIN

How Saskatchewan farmers are making a premium on their pea crops—and changing the global food marketplace

Earlier this year, Kristjan Hebert got a call from an AGT Foods grain buyer offering him a premium for his yellow pea based on its protein content.

For Hebert, the Managing Partner of a 12,000-acre grain operation in Fairlight, SK, this was a no-brainer. He sold his entire 1,300-acre yellow pea crop to AGT and he hopes to be able to continue doing so in the future.

“We like the theory that we can get premiums for doing something different,” he says.

AGT is the first grain company in Saskatchewan to offer a “**pay for protein**” program for yellow peas, driven by a growing worldwide demand for plant-based protein.

The program allows the company to offer premiums to growers based on their crop’s protein content, says Daryl Chilliak, AGT’s Director of Grain Procurement.

This year, growers received premiums ranging from 15 to 20 cents a bushel but typically, that premium could range anywhere from 10-25 cents a bushel, depending on the year and other factors, Chilliak says.

Not surprisingly, this program was welcome news to growers across the province. AGT buyers started talking to growers such as Hebert about it earlier this summer and they had a very positive response, Chilliak says.

“It tweaked guys’ interest. We got to see way more pea samples than we normally would.”

To qualify for the program, growers were asked to send samples of their yellow pea to AGT’s office in Regina, which were then sent for further testing in AGT’s factory in North Dakota. If the sample met the minimum requirements, growers were offered a premium based on the protein content.

Hebert says that offering such a premium to growers is the best way to incent them to try new things in order to increase protein levels in crops.

“They’ve definitely piqued our interest in having some new goals on what we’re trying to accomplish with our crop,” he says. “We just need to get a better understanding of the relationship that’s creating the protein content in the peas.”

What influences protein levels?

Normal levels of protein content for yellow pea usually fall somewhere between 21-23% in an average year, says Mehmet Tulbek, AGT’s Director of Research and Development.

However, those numbers will vary based on a number of factors, most significantly weather patterns throughout the growing season.

“With higher temperatures during pod and seed development, we may see protein levels closer to 24-25%,” Tulbek says.

Other factors such as soil quality and the amount of fertilizer and nitrogen in the soil can also affect levels.

This year saw pretty good protein levels in crops due to the hotter, dryer weather, Chilliak says.

“Levels were pretty good everywhere because it’s been a dryer year. Typically, we see the higher levels down south where, because of the heat zones and lighter soil, the crop comes in quicker.”

Demand going forward

Currently AGT’s program is driven by North American demand for yellow pea protein, which the company manufactures in its North Dakota factory and then supplies to food manufacturers in the United States.

The biggest demand for this protein comes from pet food manufacturers, who are looking to complement the more traditional pet food protein sources such as lamb, chicken and fish with plant-based protein in order to increase the health benefits of pet food, Tulbek says.

Research has shown that including vegetable-based, grain-free protein sources in pet food can lower rates of disease and long-term deficiencies in dogs and cats and can also increase their life expectancy.

Another growing market for pea protein is human snack food.

This demand is driven by growing consumer demand for healthier food products. Pulses offer many of the health benefits consumers are looking for, as they are proven to be a good source of protein, fibre and essential nutrients.

Research has also proven that pulse consumption is good for your heart health, can lower your risk of certain diseases, and offers benefits in terms of reducing postglucal glucose levels.

This demand has also been bolstered by the fact that technology now allows for the removal of the strong pea taste in the pea protein.

Because of these factors, demand for plant-based protein sources will only continue to grow, Tulbek says.

“You’ll see more and more of these products in the human and pet food market in coming months and years,” he says.

AGT also recently launched a program tracking protein levels across the province and correlating them to regional growing conditions, Chilliak says, which will make it easier for growers to understand their protein levels going forward.


“We started mapping the entire province, tracking all the different soil zones from 1-10, and we will look at the average of all the samples in those zones so that next year we can have a better idea of which zones generally have higher protein content.”

But beyond the generally known factors that contribute to protein levels in pulses, Hebert says he will use some of his on-farm technology to explore the relationship between protein levels in pulses and growing practices. This technology includes weather stations, soil tests, yield monitors and NDBI pictures in crops, which produces data he can then analyze to come up with conclusions.

“We’re big believers in having all the data on farms,” he says. “Number one, you have to get good data, and number two you have to make good decisions based on that data.”

“It’s that data that’s going to allow us to push these crops farther when it comes to yield and nutrient content.”

Learn more about AGT Foods’ **Pay for Protein** program by contacting AGT Foods at 1-844-248-4AGT (4248) or visiting www.agtfoods.com.



A report from Research and Markets forecasts that global demand for plant protein is to expand by 8.3 per cent over the next four years.

The donut prototypes also showed significantly improved protein and dietary fibre contents, but the sensory evaluation suggested that some improvements are needed in terms of appearance and taste, in order to be on par with a traditional donut recipe.

Another benefit is that the lentil protein can maintain moisture in products longer, which improves shelf life — making it more attractive to food processors and retailers. Chen's next step is working with local companies to incorporate pulse proteins into commercial foods.

"We are working with a gluten-free food company to make gluten-free products that have both high protein as well as great texture and flavour," Chen says.

"We are working to modify the protein by enzymes so the high level of protein can be added in food formulations to target protein claims without impacting sensory factors negatively."

Chen is exploring new extraction and processing technologies like high pressure and ultrasound in order to successfully extract proteins while activating the enzymes that affect flavour and improve pulse protein functionality. "Non-thermal techniques also has the ability to kill bacteria and activate some enzymes to decrease some anti-nutritional factors," she explains.

Research output like Dr. Chen's is expected to increase global demand for Saskatchewan produced pulse crops and ingredients.

"SPG is excited to be a partner in Dr. Chen's research, as pulse proteins are driving growth of the plant protein market," says Dr. Constance Chiremba, Pulse Science Cluster Program Manager with SPG.

"The research findings will enhance understanding of protein processing, functionality, and end-use applications of the different pulse proteins, and go a long way towards supporting the growth of Canada's pulse protein industry." •

Megan Madden is the owner of southpaw PR Inc., a strategic communications consultancy. She can be reached at @southpawMegan or megan@southpawpr.com

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Making Sure You Get Paid

A refresher on who guarantees payment for grain, and for how long

BY RICHARD KAMCHEN,
COUNTRY GUIDE

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GRAIN PRODUCERS PROTECT THE INVESTMENT THEY'VE PLANTED, fertilized, watched grow, harvested and taken the pains to safely store, but it's the Canada Grain Act that's supposed to ensure financial protection from buyers that go bust or act unscrupulously. Farmers have never had to worry about payment from the large elevator companies which have historically dominated the grain business, but recent changes to the marketing system have prompted the entrance of new players such as grain brokers. So it's worthwhile reviewing the basics — which companies protect you and for how long, and could there be a better system?

The Basics

The Canada Grain Act requires that licensed primary and process elevators and grain dealers provide security, through a bond, letter of credit, cash deposit or payables insurance to the Canadian Grain Commission (CGC) to cover their potential liabilities to grain producers.

Farmers widely believe that they ultimately pay for payment protection, with grain

companies passing on the cost of tendering security through handling or elevation fees.

Farmers can submit a claim for compensation through the Payment Protection Program when licensed buyers can't or won't pay for their deliveries.

The security licensed buyers provide is divided among producers who are owed. That security, however, may be less than the total of eligible claims, meaning farmers may not receive 100 per cent compensation.

"To date, the historical payout is 91.23 per cent over the history of the program," says CGC spokesman Rémi Gosselin.

That total includes the 15 per cent payout from Melfort, Saskatchewan's Naber Specialty Grains, he notes. That firm went into receivership in June 2015.

How Long You're Protected

Farmers not paid after delivering to a licensed company can make a compensation claim within 90 days from the date of their delivery. They won't be covered if they wait beyond 90 days to

exchange their elevator or grain receipt for a cash purchase ticket or cheque. Once producers receive a cash purchase ticket or cheque, they're covered by the licensed company's security for the lesser of two dates: 30 days from the date the ticket or cheque was issued, or 90 days from the grain delivery date.

In the case of post-dated cheques, farmers are only covered for 30 days from the date the cheque was issued, no matter the date on the cheque.

Exemptions

Grain buyers not licensed by the CGC are either exempted from licensing, outside the jurisdiction of the Canada Grain Act, or in violation of the act. Unlicensed firms provide no security, and payment protection doesn't apply to them. The CGC can't help producers resolve disputes with such companies.

Those exempted from licensing include those not purchasing directly from producers, and can include distilleries and agents acting on behalf of licensed companies.

Farmers not paid after delivering to a licensed company can make a compensation claim within 90 days from the date of their delivery. They won't be covered if they wait beyond 90 days to exchange their elevator or grain receipt for a cash purchase ticket or cheque.

Exemptions also extend in cases in which licensing isn't required to maintain the quality, safekeeping, and orderly, efficient handling of Canadian grain. One of these includes feed mills, although their exempt status has been challenged.

Buyers outside the jurisdiction of the act, who therefore may not be licensed, include feed lots and hog barns.

Cash Grain Brokers

Some farmers are using cash grain brokers as part of their grain marketing plan, but they should note that brokers need not be licensed.

"A broker who acts as a middleman between buyer and seller does not need to be licensed because they don't buy grain from producers," says Gosselin.

Some, however, are licensed.

"It all depends on if they are paying the producer and contracting with the producer," Gosselin explains. "If they are doing that, then they are a grain dealer and licensed as such." •



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The Prosperity of Pulse Crops

Adding a pulse to your rotation
can add a \$25 per acre benefit
in following years' crops

BY JANE CAULFIELD

RESEARCHERS, GROWERS, AND AGRONOMISTS AGREE that including a pulse as part of your crop rotation can provide nitrogen-fixation benefits to the soil, which can positively impact crops grown in rotation after pulses. While there is obvious agronomic benefits to this inclusion in rotations, quantifying the economic benefit of pulses in rotations has always been of interest to growers, but the hardest to quantify.

"The economics of all the benefits are very hard to put an exact measure on. How do you put a value on being able to get into a field and seed it at more optimum timing, or a value on improved soil health?" says Sherrilyn Phelps, Agronomy Manager for Saskatchewan Pulse Growers (SPG). "Some researchers, such as Dr. Jeff Schoenau, are exploring the economics and have suggested a minimum of \$25 per acre benefit in the year or two following a pulse crop."

According to Phelps, the benefit provided by pulses leads to an increase in potential for higher yields and more robust harvests in the years that follow a pulse crop.

Digging Into the Economic Benefits of Pulse Crop Rotations

Crop rotations are a major contributing factor to the overall health of a crop, including breaks in disease and insect cycles.

"Inclusion of pulses in a crop rotation helps reduce disease development and severity in susceptible crops to levels below economic thresholds. This is due to the opportunity to widen the period between planting of susceptible crops on the same field, resulting in the reduction of disease pathogens," says Dr. Patrick Mooleki, Research Scientist in Oilseed Agronomy for Agriculture and Agri-Food Canada.

Pulses are also known to have positive effects on soil quality including improved soil structure, increased soil aeration, stimulated soil biological activity, and increased organic matter.

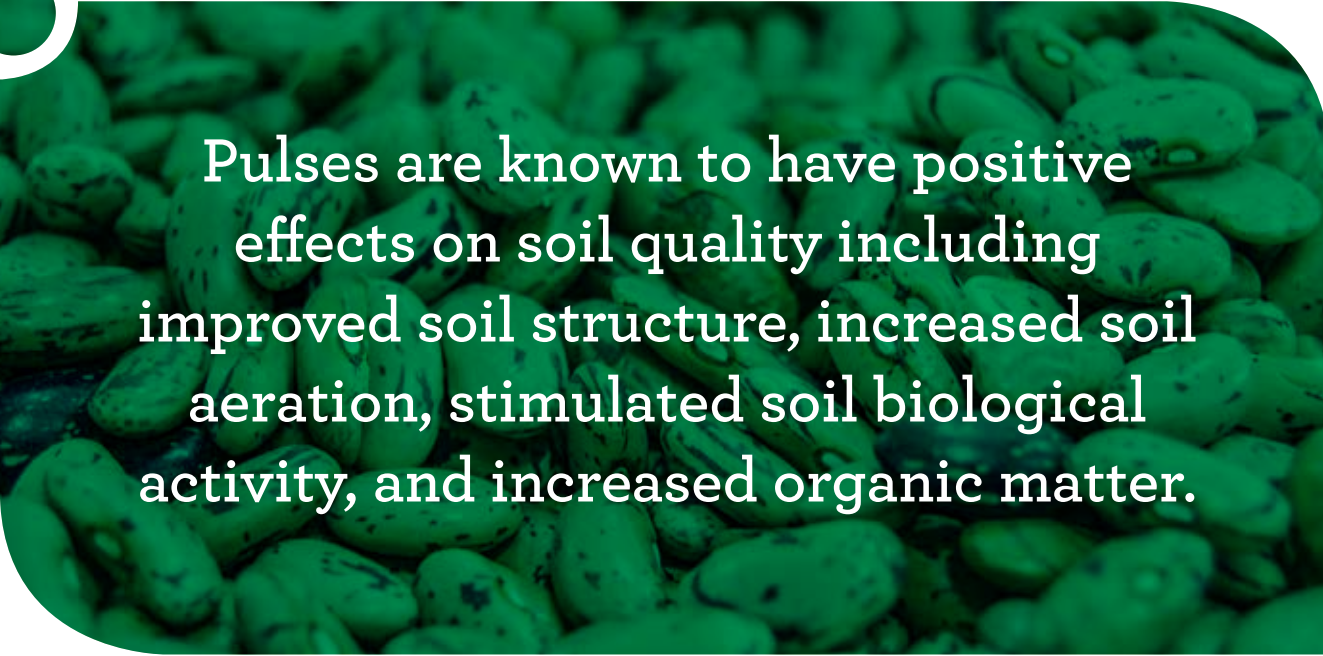

"There are many benefits in the soils and organic matter left behind including,

enhanced uptake of other nutrients such as phosphorus due to the creation of a beneficial rhizosphere from root exudates, and microbial associations and improved root growth because pulses contribute to the amelioration of soils and improvement in soil structure," says Mooleki.

They can also help manage moisture content in soils.

"Some pulse crops are later maturing, such as faba beans, and use moisture well into the fall. In areas where excess moisture is a concern, the fields that had faba beans grown previously are often more accessible earlier in the spring, which means a grower can seed those fields sooner than other wetter fields which can be a problem in northeast Saskatchewan," says Phelps.

Phelps adds that other pulses with shorter maturity, such as peas, can help contribute to higher moisture content because they are harvested earlier and the soil has more time to recharge. "This can be a benefit going into the next year, especially in areas of the province that tend to be drier," she says.



Pulses are known to have positive effects on soil quality including improved soil structure, increased soil aeration, stimulated soil biological activity, and increased organic matter.

The Bounty of More Nutrients

Pulses are well known for their benefit of nitrogen fixation and the positive impact it has on crops that follow in the rotation. By fixing their own nitrogen, pulse crops are not relying on soil nitrogen but importing nitrogen into the fields from the air. Some of the nitrogen that is fixed is exported in the grain, but there is still some that remains in the crop biomass left in the field.

"This biomass, which includes both above-ground and below-ground material, and root exudates, provides a source of nitrogen that becomes available to the following crop as the residue degrades," says Phelps. "This nitrogen benefit can last up to two seasons after a pulse crop is grown."

The exact amount of nitrogen benefit from a pulse crop varies widely and is hard to predict as many factors come into play, but nitrogen fixation can help reduce costs both up-front and after harvest.

The Long Game

Like all other crops, planting pulses still have expenses attached to it – they still have to be seeded, maintained, and harvested. And, depending on the growing year and specific environmental conditions, the crop itself may only yield a small profit. Yet, a lower cost of production of other crops because of a pulse crop in rotation, and/or increased production in the year following a pulse can prove to have a big impact.

"Since nitrogen is the number one single variable cost of production in Saskatchewan, reduction in the use of nitrogen fertilizer (during pulse year) will reduce production costs and improve the farmer's bottom line," says Mooleki. "Reductions in the cost of production will be seen in a lowered cost of disease and insect control due to reduced severity of infection and infestation."

In the end, adding pulse crops to a crop rotation will prove to have benefits for years to come, which can help improve the overall health of your farm.

"The benefits to diversifying your rotation is not about returns in any one year but it is about returns over the long term," says Phelps. "Optimizing yields to remain profitable and sustainable over the long term is what rotations are all about." •

Jane Caulfield is an experienced journalist and writer, and is the owner of Tin Box Digital Content.

New Varieties in the New Year for Producers

Plenty of pulse
crop options to add
to your rotation

BY GEOFF GEDDES

THROUGH THE VARIETY RELEASE PROGRAM, Saskatchewan Pulse Growers and the Crop Development Centre at the University of Saskatchewan, have made over 120 pulse varieties available to growers royalty-free as part of a 15-year breeding agreement. As farmers make their seeding decisions for the coming year, there are some intriguing options to consider.

Peas

Pea growers have a number of variety options for 2019 in many market classes that are widely adapted to Western Canada.

"For yellow pea certified seed, CDC Inca and CDC Saffron will be widely available in 2019. Both offer high yield, good lodging resistance, and good resistance to seedcoat breakage," says Dr. Tom Warkentin, Professor in the College of Agriculture and Bioresources at the University of Saskatchewan. "CDC Amarillo is similar but with only fair resistance to seedcoat breakage."

Certified seed of CDC Meadow is another yellow pea variety providing high yield and early maturity. It is also the most widely grown yellow pea over the past five years.

"In contrast, CDC Spectrum and CDC Athabasca will be at registered seed level in 2019, with certified seed becoming available in 2020. They feature high yield and good lodging resistance," said Warkentin. "Spectrum also boasts high protein content, while Athabasca is known for its jumbo seed size."

The aptly named CDC Canary is a yellow pea that offers similar benefits to Spectrum and Athabasca, and is particularly suited to northern regions due to its early maturity.

"With green peas, certified seed of CDC Raezer and CDC Limerick are available, boasting strong resistance to lodging and bleaching. The former is an excellent seed type with moderately high yields, while the latter features excellent yields and the highest available protein content," says Warkentin.

A good certified seed option among green peas is CDC Greenwater, bringing high yields, early maturity, good lodging, bleaching resistance, and fair resistance to seedcoat breakage. Two other notables are CDC Spruce (registered seed) and CDC Forest (foundation seed). They both include high yields, early maturity, good lodging resistance, fair resistance to seedcoat breakage, and good bleaching resistance. In particular, Warkentin rates CDC Forest as a very good seed type.

Growers looking for maple pea options can choose from CDC Mosaic, a moderately high yielding variety with good lodging resistance, and CDC Blazer, the highest yielding maple pea.

"Among other pea varieties, CDC Jasper is a forage pea known for its high biomass, small seed size, and good lodging resistance. CDC Dakota is a dun pea that promises high yield, good lodging resistance, and high protein content."

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Aphanomyces seems to be everywhere. If you've grown pulses in the past five years, your soil is probably harbouring this pathogen. In 2016, 60 - 70% of pea and lentil fields tested positive for the disease in Alberta and Saskatchewan.¹



Symptoms of aphanomyces can be seen **within 10 days of infection** in peas and lentils.

Pythium root rot has multiple hosts and can also be found across the prairies. The pathogen is able to survive in the soil over a wide temperature range, waiting for the ideal weather and soil conditions to attack soybean seeds as soon as 90 minutes after planting.



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Lentils

"A new small red lentil just becoming available is CDC Redmoon," says Laurie Friesen, Seed Program and Research Project Manager with Saskatchewan Pulse Growers. "Though it is not herbicide resistant, it is the highest yielding small red variety, with yields at 114 per cent of the check (CDC Maxim) in the southern regions of the province, and 106 per cent in the north. It is a variety that growers should really consider."

Chickpeas

"In the past couple of years, CDC Leader and CDC Orion have become the dominant Kabuli varieties for seeded acres, followed by smaller acres of CDC Frontier and CDC Luna," says Dr. Bunyamin Tar'an, Professor with the College of Agriculture and Bioresources at the University of Saskatchewan. "Both CDC Leader and CDC Orion have medium-to-large seeds with good yield and are earlier maturing than CDC Frontier."

As Tar'an explains, 2018 was marked with warm, dry conditions in most chickpea growing areas, making the crop mature slightly earlier than normal, with less disease in general, but some pressures on yield.

"CDC Palmer is the newer Kabuli cultivar with good yield potential and medium-to-large (9-10 millimetres) seed size. The seed is a light cream-beige colour with typical ram-head Kabuli seed shape. It is earlier maturing than CDC Orion and moderately resistant to Ascochyta blight. CDC Palmer is well adapted to all current chickpea growing regions of Brown and Dark Brown soil zones of Saskatchewan. In 2019, it is anticipated there will be ample supply of CDC Leader, CDC Orion, and CDC Palmer."

For the Desi-type, CDC Consul is the latest released cultivar. It has a light tan seedcoat colour, which is one of the desirable visual seed characteristics of the type. Long-term yield average of CDC Consul is 108 per cent of the check cultivar (Amit) in both Brown and Dark Brown soil zones. Seed size of

CDC Consul on average is 300 grams per 1,000 seeds, with a long-term Ascochyta score of 4.0.

Dry Beans

Your choice of a dry bean variety will depend on a couple of key factors.

"The first criteria is irrigated versus non-irrigated," says Dr. Kirstin Bett, Professor in the College of Agriculture and Bioresources at the University of Saskatchewan.

Then there is the question of wide-row or narrow-row. Most dryland farming will be narrow-row, but those in irrigation farming favour wide-row.

"I have been breeding beans for narrow-row for years now, so there are varieties out there that are fine for that purpose, and you do not need specialized equipment if you opt for narrow-row."

For dryland production in 2019 CDC Blackstrap is an available option. While not technically a new variety, it has been given a new lease on life thanks to recent success.

"That variety just kind of blew up this year, in a good way," says Bett. "People are trying it all over the province. North Battleford did very well with CDC Blackstrap, and it matured well in Nipawin."

While there is some risk to growing a dry bean like CDC Blackstrap, Bett believes it is less risky than soybeans and offers a greater upside.

"Soybeans can be hit and miss, but we have been breeding dry beans for years so they have really adapted to their environment. CDC Blackstrap is fine on narrow rows and can be direct combined. Producers have been doing quite well with it as opposed to some others where they swath or undercut, which is what they are doing in the irrigated regions," says Bett.

Then there is CDC Ray, a Flor de Junio seed that caters to a niche Hispanic market in the United States and Mexico.

"This is a high value speciality bean that yields very well, and probably benefits most from being a wide-row option. I would keep it under irrigation, which is generally the case for wide-row. At the same time, I have

seen it in narrow rows in our test plots and the yield has been tremendous. I am not aware of that being tried anywhere else yet, but it is the first year that CDC Ray is commercially available, so someone may experiment with narrow-row down the road."

Faba Beans

At present, the leading variety for zero-tannin faba beans is Snowbird, a small-seeded variety which offers high yield. A new zero-tannin faba bean variety that will have similar yield, but with a smaller seed size, was released in 2018 and should be commercially available in the near future.

In spring 2018, large-seeded food-type (normal tannin) faba bean varieties were released to growers. "The industry is moving to varieties that are low in vicine and convicine, which can cause health concerns for a small segment of the population," says Friesen. "This is a big, positive change that will open up new markets and applications for faba beans. It offers the potential for applications such as fractionation into starch and protein concentrates, or milled to produce flour which can be used as ingredients to boost protein levels in food products. Because this protein will be low in vicine and convicine, food manufacturers can rest assured that it is safe for human consumption."

For a listing of all select seed growers and the varieties they carry, producers can consult the Saskatchewan Pulse Growers' Select Seed Grower directory at saskpulse.com.

Also, under the Growing Pulses section of the website, growers can click on the Seeding section for more detailed information on pulse varieties.

The dawn of another year is always exciting, but if one of these new pulse varieties can boost your bottom line in 2019, that is something to celebrate. ●

Geoff Geddes is a freelance agriculture and business writer based in Edmonton. Contact him at geoffgeddes@thewordwarrior.ca



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2019 Winter Regional Pulse Meetings

Saskatchewan Pulse Growers and the Saskatchewan Ministry of Agriculture are teaming up to host the annual Winter Regional Pulse Meetings for growers across Saskatchewan.

MONDAY, FEB. 4
8:30 AM - 4:00 PM

Rosetown
*Rosetown and District
Civic Centre*

TUESDAY, FEB. 5
8:30 AM - 4:00 PM

Swift Current
Stockade Building

WEDNESDAY, FEB. 6
8:30 AM - 4:00 PM

Assiniboia
*Prince of Wales Cultural
and Recreation Centre*

THURSDAY, FEB. 7
8:30 AM - 4:00 PM

Regina
*Salon B, Queensbury
Convention Centre,
Evraz Place*

This year's meetings include:

- Pulse insect update from James Tansey, Provincial Specialist, Insect/Vertebrate Pest Management
- Pulse market outlook from Marlene Boersch, Mercantile Consulting Venture Inc.
- Addressing pulse agronomy concerns specifically Aphanomyces and kochia, with Sherrilyn Phelps, Saskatchewan Pulse Growers

To register for a meeting in your area, contact the Ag Knowledge Centre at **1-866-457-2377** or aginfo@gov.sk.ca

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Diversifying Weed Control Strategies for Pulse Growers



Herbicide layering, tank-mix options,
and beneficial insects offer increased
chances of success with weeds

BY TRUDY KELLY FORSYTHE

PULSES TEND TO BE WEAK COMPETITORS when it comes to weed pressure. This makes strong weed control with an integrated weed management strategy essential. Fortunately, there are several options available to producers to help them diversify their strategies.

The go-to option for growers is often herbicides, and within this there are some best management practices that will optimize weed control, as well as lessen the impact on the growing problem of herbicide resistance.

Choosing Your Herbicide

Clark Brenzil, Provincial Specialist, Weed Control with the Saskatchewan Ministry of Agriculture, says because pulses are so varied in their tolerance to the various herbicides on the market today, pulse growers should choose ones that are

registered and proven to work on their particular pulse crop.

"Pulse producers have had a history of innovation, conducting field-scale research back when pulse crops were new and had few herbicide options that often did not have great tolerance on the crop or adequate weed spectrums," says Brenzil. "This, 20 years ago, was out of necessity, but the risks of doing this today are twofold."

"One, not having a solid foundation of research behind a product puts your crop at undue risk of injury, and two, there is heightened vigilance from the buyers of pulses to the presence of unregistered pesticides in shipments of grain," he adds. "Buyers today have access to technology that can detect these with ever greater sensitivity and at lower cost, meaning they check more often and have better odds of

finding something amiss. Local grain buyers also hold back samples from deliveries in case a problem arises and they need to take legal action." Pulse growers should be aware of possible marketing restrictions that may arise from using certain crop protection products improperly.

As for choosing products proven to work, Brenzil explains that because many of the herbicides for pulses are not particularly diverse when it comes to herbicide groups, pulse crops have challenges with herbicide-resistant weeds that, without alternative herbicide options, go untreated and compete with the crop.

Strategies such as diversifying tank-mix products, herbicide layering, and herbicide rotation can help control weeds and slow the development of herbicide-resistant weeds.

Since pulse crops have few herbicide options, this also means tank-mix options allowing producers to combine multiple herbicide groups, or modes of action, are limited. Herbicide layering gives producers another way to apply pressure to the weeds, at different stages or timings, using as many different modes of action or herbicide groups as is economical.

"While there are still few foliar herbicide tank mixes, there are more options becoming available as soil-active herbicides that can be used in herbicide-layering programs," says Brenzil, adding that research has found that rotation alone was not providing the level of protection against resistance that scientists originally believed it would, but merely delayed its development.

"Mixing or layering two modes of action that control the same weed species, creates a multiplier effect on the risk of finding resistance, whereas rotating herbicides is only an additive buffer against resistance."

It is important that herbicide group mixes have overlapping activity on the same target weed prone to resistance, and to always apply them at the recommended rates and proper time.

A Biological Option

Given the challenges of herbicide use with pulse crops, researchers are looking at how the use of beneficial insects and seed predation fit into the overall spectrum of weed control for pulses.

Dr. Christian Willenborg, Associate Professor in the Department of Plant Sciences at the University of Saskatchewan's College of Agriculture and Bioresources, says promoting the abundance of invertebrate species, such as insects, is critical to managing weed seeds that are dispersed into the soils seedbank, because they represent formidable agents of biological weed control.

He stresses that there are few published reports in the literature that examine weed seed predation in pulse crops, which is why they are now assessing the importance of weed seed predators to weed seed consumption within pulse crops. Specifically, they are looking at how much

It is important that herbicide group mixes have overlapping activity on the same target weed prone to resistance, and to always apply them at the recommended rates and proper time.



Weeds are a huge threat to pulse crops, who cannot compete against them.

seed predation occurs in various pulse crops, which species contribute to the predation, and whether seed predation in different pulse crops differs from some of the more problematic weed species, such as wild mustard, volunteer canola, and kochia.

"Weed seed predation is one of the only free weed control measures growers have at their disposal, but creating an ecosystem that favours the seed predators is key," says Willenborg. "Herbicide resistance is becoming an increasing problem, and even weed seed destructors are not capable of controlling all weed seeds. Ensuring we have seed predation occurring in fields is critical to managing weed populations and especially, weed escapes, over the long term."

Research has discovered that of all invertebrate predators, carabid beetles are

the most abundant in the agroecosystem, and have the greatest effect on seed consumption. Weed seed predation along with herbicide layering and diversifying tank mix options are all part of Willenborg's larger weed research program, funded by Saskatchewan Pulse Growers, tasked with finding a robust strategy for long-term weed management.

These weed management options, when partnered with other non-herbicide options, including tillage, harrowing, and higher seeding rates, can provide pulse producers with more options to help their crops compete against weeds. •

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**Preparing Your Pulse
Crops for Success**



Patches of yellow in a pea field indicate root rot.

Root Rots on the Prairies



Latest survey results
show root rots still causing
problems for pulses

BY MEGAN MADDEN

SEEING POOR EMERGENCE in patches of your pulses? Maybe some yellowing of leaf tissue? Decayed, brown roots? You might be looking at root rot.

Root rot is a soil-borne disease that can affect the underground portion of peas and lentils at any stage. Understanding this disease and the pathogens that cause it is essential, because once root rot sets in, there is no treatment available.

This is where Dr. Syama Chatterton comes in. Dr. Chatterton is a plant pathologist at the Lethbridge Research Centre with Agriculture and Agri-Food Canada who conducted a root rot survey across Saskatchewan in the summer of 2018.

"We performed a lower number of surveys across the Prairies this year compared to previous years because we have already established that *Aphanomyces euteiches* and a couple of *Fusarium* species are the predominant pathogens. Research efforts and time are now better spent on looking at management options," she explains. "Having said that, we did survey approximately 26 fields in Saskatchewan so that we can use the data to start validating a quantitative soil assay."

Chatterton discovered that all of the fields surveyed had root rot present. Within a field there were 10 sampling sites and on average 85 per cent of the sampled sites came up positive for root rots. This shows that root rots are being found across the majority of a field rather than in isolated areas. The average severity rating across all 26 fields was fairly low at 2.8 out of 7 where 7 is highest severity. "We have not tested pathogen composition yet, but based on the root symptoms only, *Aphanomyces* seemed to be present in about 40 per cent of fields," says Chatterton. It is difficult to identify the composition of root rot pathogens once plants are already damaged or dead because other organisms start to feed on decaying tissue. Also, there is often more than one pathogen present in root rot, making it harder to determine which pathogen was the primary cause of the disease.

These different pathogens thrive under different conditions. Weather and precipitation have a significant impact on infection, depending on moisture levels. *Aphanomyces euteiches* belongs to a group of root pathogens commonly referred to as "water moulds." Chatterton explains that water-saturated fields are the ideal conditions for *Aphanomyces* to infect and spread across a field with water

movement. "Dry conditions inhibit infection by *Aphanomyces*, as it requires water for infection," she continues. "But some of the other pathogens in the root rot complex, like the *Fusarium* spp., can still infect under dry conditions."

The above average snowpack melted rapidly in the spring of 2018, causing wet soil conditions which provided excess spring moisture for early infection. "The effect of these early infections was then exacerbated by the dry conditions in July and August, as plants already starved for water would have a very diminished root system due to early root rot," Chatterton says.

Diminished root systems can reduce stand establishment, impact nitrogen fixation, and have negative effects on root distribution and vigour. Those factors can then lead to uneven plant stand, which can cause subsequent difficulty in managing weeds in those areas.

Prevention of *Aphanomyces* root rot through field selection is currently the only tool to avoid a scenario like this repeating itself. As of today, there are no resistant cultivars, and seed treatments provide only early season suppression, and even then, only for about two weeks.



The yellowed foliage and caramel coloured roots pictured above are a sign that root rots have infected your crop.

"It is important to know the history of your field, how often has a pea or lentil crop been planted in that field, and how recently?" advises Chatterton. "If you have not had a long history of growing these susceptible pulse crops, have been rotating out of peas and lentils for four or five years, and the last pea or lentil crop you grew did not show any signs of root rot, then it is likely safe to plant peas or lentils in that field."

Growers are encouraged to watch their fields in the upcoming season for small patches of yellowing plants in water tracks or low spots in the field, as an indicator that a root rot problem may be developing. If a field has a long history of pulse production, has been on a tight rotation (peas or lentils

every two to three years for a number of years), and the grower has noticed yellowing patches in previous crops, then Chatterton recommends choosing another non-host pulse crop (soybeans, chickpeas, or faba beans), or other non-pulse crop for the field.

While conducting your regular soil tests, try to choose some samples from areas that are prone to flooding, or that have yielded poorly in the past, to test for *Aphanomyces*. "Remove the stubble layer and take a soil sample from the top 15 to 20 centimetres of soil," explains Chatterton. If *Aphanomyces* is detected, it is important not to grow a susceptible host for a minimum of six years, as it can infect peas, lentils, alfalfa, and more.

Rotation, soil testing, and strategic use of inoculants and seed treatments can all help mitigate the risk of infection. Moving forward, managing fields for root rot, in order to keep cropping options available, can help keep growers profitable. •

Megan Madden is the owner of southpaw PR Inc., a strategic communications consultancy. She can be reached at @southpawMegan or megan@southpawpr.com

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How Did Pulse Crops Fare in 2018?

What kind of quality
actually came out of
harvested crops this year

BY CHUCK PENNER, LEFTFIELD
COMMODITY RESEARCH

NOW THAT THE MACHINERY IS SAFELY PUT AWAY FOR THE WINTER, it is time to take stock of how 2018 turned out. While each individual farm will have its own good or bad performance, we will be looking at the overall picture, with help from Statistics Canada (StatCan) and the Saskatchewan Ministry of Agriculture (SMA).

In 2018, pulse crop production seemed like a bit of a roller coaster, including some thrills and chills, with outcomes extremely variable even for farms a few miles apart. For some, precipitation was too much, for others too little, and for many, at the wrong time. This year too, crop development was delayed as much as two weeks by forest fire smoke from the west, which meant harvesting in the snow for some, and some reduced quality. Just another season in Western Canada.

After all said and done, the 2018 pea yield turned out exactly the same as last year, according to StatCan. Because of a 12 per cent drop in seeded area, the 2018 crop came in just under 3.6 million (M) tonnes, roughly 0.5 M tonnes less than last year.

This 12 per cent decline was not spread out evenly though. The yellow pea crop was estimated down 16 per cent while green peas were up 10 per cent, and production of other minor classes was estimated 14 per cent higher than a year ago.

According to SMA, the quality of the 2018 pea crop was not as bad as some of us had expected. The grade profile in the last provincial crop report showed 87 per cent in the top two grades, not as good as 2017, but very close to average. This is helping support a solid export program in 2018/19.

The smaller 2018 pea crop more than offset the larger carry-over from 2017/18, meaning that 2018/19 supplies are down somewhat from a year ago, relieving some of the heavy tone in the pea market. That said, a solid export program so far in 2018/19, with some glimmers of hope for Indian demand, could actually cause supplies to tighten up. Firmer prices are already sending some optimistic signals.

Based on what farmers told StatCan, the Canadian lentil crop did not turn out quite

as well as peas. The 2018 yield came in at 1,245 pounds per acre (lb/ac) or 20.7 bushels per acre (bu/ac), the lowest yield since 2007/08. The reduced yield, together with a 14 per cent drop in seeded area caused the 2018 crop to come out to 2.1 M tonnes, nearly 500,000 tonnes less than last year.

The drop in production all showed up in red lentils, with that portion of the crop declining by 34 per cent compared to last year. Acreage of green lentils had increased however, especially for large greens, and even with slightly lower yields, green lentil production was 23 per cent larger than last year. That shift away from reds will probably help the market, as India has been a much larger player in the red lentil side of the market.

When it comes to quality, the 2018 lentil crop performed not too badly, with 88 per cent ending up as a No. 2 Canada or better, according to SMA. That is not as good as last year's 96 per cent but still beats the average quality of 71 per cent in the top two grades.

The smaller Canadian lentil crop provides a little relief for the heavy supply situation, especially for reds, but total supplies in 2018/19 are still nearly 100,000 tonnes more than last year. Just like peas, recent developments in the lentil trade are helping provide a little more optimistic outlook that the worst could be over.

Chickpea yields were also below average in 2018/19, but that was not enough to offset the huge acreage increase. As a result, StatCan pegged the 2018 chickpea crop at 311,000 tonnes, more than double last year's crop, and the vast majority (over 95 per cent) is Kabuli chickpeas.

Just like the other pulse crops, SMA indicated the quality of the 2018 chickpea crop was lower than last year but better than average. This year, 95 per cent of chickpeas still managed to end up as a No. 2 Canada or better, compared to last year's 100 per cent and the 10-year average of 78 per cent.

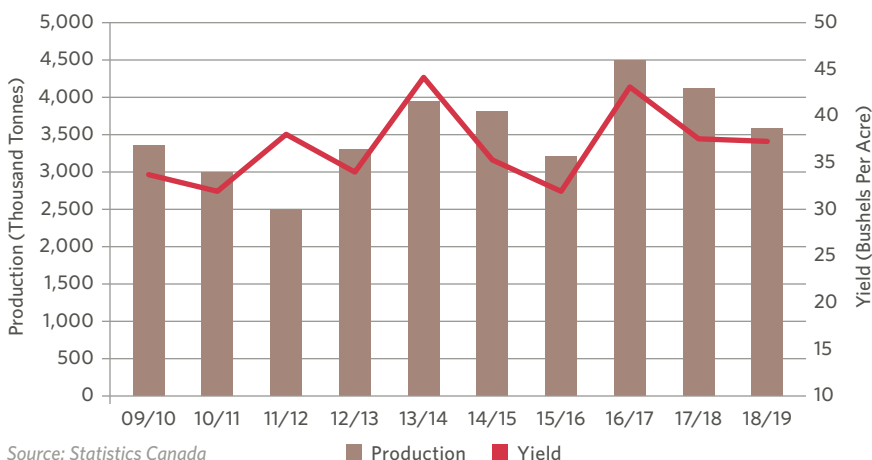
It is not just Canada that has a larger chickpea crop this year, which will make it more difficult to find a home for the big 2018 crop. Some improvement is possible if the Indian crop situation does not turn around, but it looks like heavy supplies could linger in Canadian and North American chickpea markets.

For dry beans, StatCan estimated a record yield of 2,240 lb/ac, which brought the Canadian crop to 341,000 tonnes, six per cent larger than last year and the largest crop since 2006/07. Of this total, StatCan reported that 14,200 tonnes came from Saskatchewan.

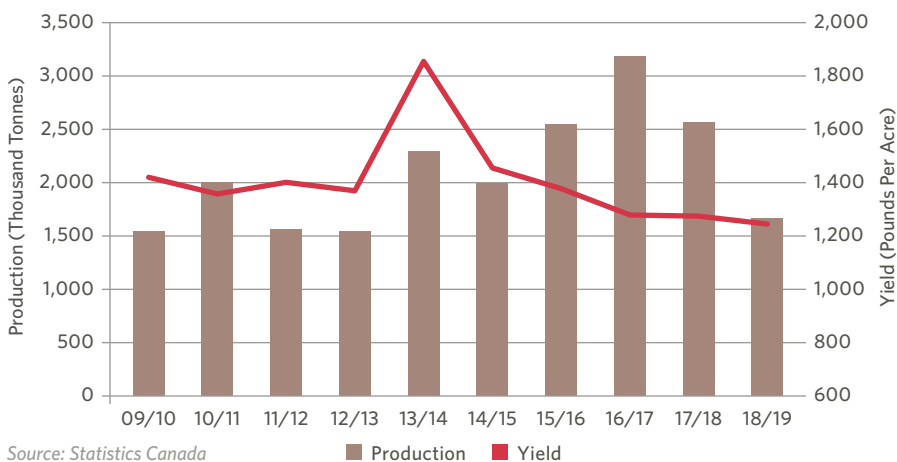
The 2018 faba bean crop was estimated by StatCan at 91,300 tonnes, nine per cent less than last year, but that was achieved in spite of a 17 per cent drop in seeded area, as the 2018 yield improved to 44 bu/ac. There were not any quality estimates from SMA for faba beans, but we have heard that the smoke-caused harvest delays resulted in discoloured seeds for some farmers. •

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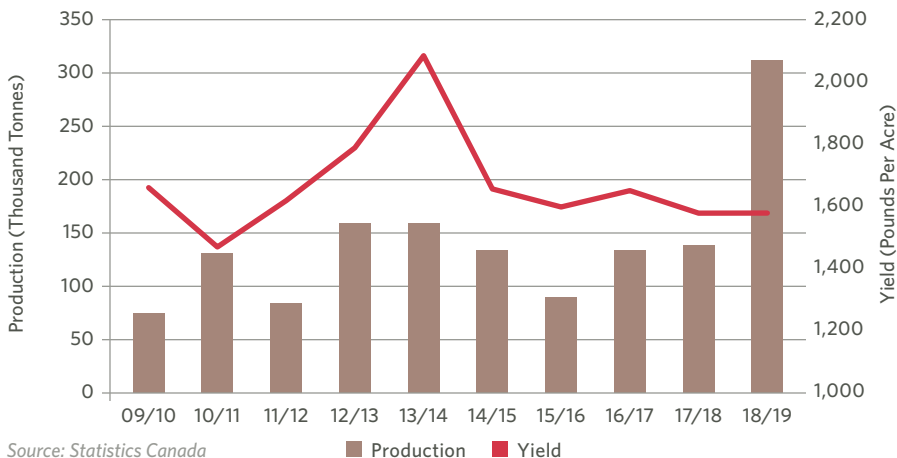
Field Pea Production & Yield



Canadian Lentil Production & Yield



Canadian Chickpea Production & Yield



New Developments with India

The Canadian pulse industry continues to work with India on market access restrictions

BY DELANEY SEIFERLING

AS SASKATCHEWAN GROWERS

contemplate their seeding options for another year, market access issues for pulses are surely top of mind.

In the past couple of years growers have faced severe export restrictions for pulses to India, Canada's largest market. This includes tariffs on peas, chickpeas, and lentils, and ongoing regulations that require Canadian pulse exports to be fumigated with methyl-bromide.

Some progress has been made in addressing and mitigating these restrictions, says Mac Ross, Pulse Canada's Manager, Market Access and Trade Policy.

Pulse Canada has long been working to alleviate these issues on behalf of Canadian growers, but recently they have seen several new developments.

Pulse Canada has been working with the Canadian government for more than a decade to address India's requirement to have Canadian pulse exports fumigated with

methyl-bromide, but the issue became more urgent as of late last year, Ross says.

While Canada had historically been granted a series of exemptions to this regulation since it was issued in 2003, it expired last year and Canada has been forced to comply or face a penalty fee ever since.

"Fumigation is an unworkable requirement in Canada due to various regulatory and product label restrictions," Ross says.

In response to this, the Canadian pulse industry has been working with the Federal government to effectively make the case to the Indian government that Canada's safety systems ensure that pulse shipments to India comply with import requirements, and mitigate the risk of introducing regulated pests to India, without the need for mandatory fumigation.

"Canada continues to strive for a bilateral agreement with India on plant protection," Ross says.

"It is important that we continue to drive this issue forward with the Canadian and Indian governments as it is critical that we have science and risk-based phytosanitary conditions for Canadian product when India eventually resumes importing pulses."

After the Federal Government visited India this past February, Prime Ministers Trudeau and Modi agreed to work together to finalize an arrangement to enable the export of Canadian pulses to India, free from pests of quarantine importance, with mutually acceptable technological protocols. Both parties committed to finalizing the arrangement by the end of 2018, but as of early December, a resolution had not been reached.

As part of this agreement, India sent a delegation to Canada this past September to review Canada's systems-based approach to handling grain throughout the supply chain, to ensure that the exported product meets the phytosanitary requirements of the importing country.



Pulse Canada continues to work alongside the Canadian government to ensure that pulses such as these continue to have access to the Indian market.

Pulse Canada was one of the hosts for the delegation, which included government officials and scientists from the Government of India's plant quarantine group.

The overall goal of the tour was to demonstrate to the delegation how Canadian pulses do not pose a phytosanitary risk to India, but it included a very thorough look at the Canadian safety system. Delegates learned how Canadian pulses are prepared for export to India, with presentations and technical meetings with members of the Canadian Food Inspection Agency (CFIA), the Canadian Grain Commission (CGC), and the national pulse industry.

The tour also included stops at two pulse farms in Saskatchewan, where the delegation was able to see firsthand how crops are produced, and how on-farm tools and technology are used to control threats such as weed seed, insects, and diseases.

"Farm visits are an important aspect of the review," Ross says. "It is a chance to showcase the various methodologies and technologies used on Canadian farms for grain storage and pest control prior to the grain entering the supply chain, even though the delegation did not come in the winter

when the Canadian prairies experience their best pest control management tool, the extreme cold weather."

The tour also visited pulse processing plants and an inland grain terminal in Saskatchewan, as well as CFIA plant health labs, CGC inspection offices, and a Vancouver port terminal.

"It was a very thorough review and examination of Canada's systems-based approach to handling grain prior to export," Ross says.

The next steps for Pulse Canada will be to continue to push for progress on a final agreement.

"We will continue to work with the Federal government, as they engage with their Indian counterparts following the delegation's review, to work towards finalizing an arrangement on plant protection by the end of 2018," Ross says.

Pulse exporting nations, including Canada, are also addressing the challenge of working with India to improve the predictability and transparency of pulse import policy, including both the quantitative restrictions and import tariffs that have impeded access

for pulses into the India market. This work is being led by the Global Pulse Confederation (GPC) in partnership with Geneva-based trade officials from many pulse exporting nations. This international co-operation includes multi-lateral advocacy for predictability and transparency in all policy decisions.

However, these trade issues have also highlighted the importance of other work being done by Pulse Canada and Saskatchewan Pulse Growers to diversify markets for Canadian pulses, Ross says.

"These access issues have caused a virtual halt of the marketplace in India, which underscores the importance of our efforts to diversify and expand exports into new uses and markets."

The Canadian pulse industry has set a mandate to have 25 per cent of Canadian pulse production diversified into new market opportunities by 2025, by growing the use of pulses in food products, feed and pet food, and foodservice operations. ■

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What Is Next for Neonics?

With a looming proposed phase-out of all uses of neonicotinoid seed treatments, farmers are looking to maintain access, but also looking for alternatives

BY LINDSEY SMITH

THERE HAS BEEN SIGNIFICANT EFFORT

put in on behalf of pulse growers to maintain access to key insecticide classes currently under review by the Pest Management Regulatory Agency (PMRA). The pulse industry has fought hard for a positive outcome and an extension on the consultation period following re-evaluation of the registration of neonicotinoid products — imidacloprid, clothianidin, and thiamethoxam.

The industry feels that there is more data to consider in support of a science-based, thorough risk assessment of these products, and it wants the opportunity to provide more data, such as water monitoring data. As it stands, these actives are headed for a three- to five-year phase out in Canada, a decision that could have devastating impacts on pulse growers' ability to protect their crops.

The PMRA is proposing the phase-out based on what it has determined to be an unacceptable risk to aquatic insects. Saskatchewan Pulse Growers (SPG), alongside Pulse Canada and Alberta Pulse Growers (APG), and the entire Canadian pulse industry value chain want and respect a robust, science-based pesticide regulatory process, but are concerned that the proposed decision on neonics

did not consider the best available data in its decision, including the lack of alternative options to control many insects, the economic implications for growers, and mitigation strategies that could be used to reduce the risk of runoff into waterways.

For example, the PMRA chose not to consider specific Prairie water monitoring data, stating that the areas sampled had been under "unusually dry" conditions for three years. The pulse industry submits that water monitoring data should be representative of Prairie neonic use patterns, soil types, and water movement — dry conditions exist in some regions of the Prairies every year, so this data should be considered in the re-evaluation of neonics.

SPG, Pulse Canada, and APG have been working closely with other grower groups in the industry's submission to PMRA's consultation process.

Nevin Rosaasen, Policy and Program Specialist with APG, has been at the forefront of this submission, and reiterates that pulse growers want to use protection products safely. He stresses that soil, wetlands, and water are where farmers derive their livelihood — it is absolutely critical that farmers use products that are deemed safe for use for both the

humans that live on and near farms, and also the insects and animals that share the environment.

"Producers want to know if there is a risk," Rosaasen says, and that means that measured risk needs to include actual data from the Prairie ecosystem, data that would reflect actual in-field use patterns, and soil and water conditions.

Limited To No Pesticide Alternatives

Maintaining access to neonics is most dire for peas, dry beans, chickpeas, and, in some cases, soybeans, and lentils.

Chickpeas and lentils would be without any available products for protection against wireworm. For dry beans, there are currently no alternatives to neonics for wireworm and corn root borer protection, nor are there alternatives for seed corn maggot protection in soybeans. While representative of fewer acres, all of these pests do their damage below-ground and there are no alternatives for control.

"One of the largest issues, however, is with pea leaf weevil," says Sherrilyn Phelps, Agronomy Manager for SPG. "With this



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insect the adults feed above-ground so there are foliar options available. However the foliar options are not as effective at protecting yield as the seed treatments. This is because it is the root and nodule feeding by the larvae (young that hatch from the eggs laid by the adults) that impact the yield of the crop by reducing the plant's ability to fix nitrogen."

Not only does this have a devastating impact on yield, but the solution is to apply nitrogen fertilizer. Having to fertilize a pulse crop with nitrogen eliminates one of the major environmental benefits of including pulses in rotation.

The impact would be substantial, Rosaasen says, as 2.5 to 3 million acres of land will require nitrogen fertilizer that could have been derived from nature, all because of losing access to neonics.

Integrated Pest Management

The pulse industry is one that already employs integrated pest management, using field- and region-specific monitoring and risk assessment, before deploying an insecticide seed treatment.

Insecticides are the line of defence, and not applied prophylactically in pulse crops. They are used only after field-level risk assessments, which consider beneficial insects, pollinators, and predators. What is more, the Prairie Pest Monitoring Network offers pest surveys and input from provincial and independent agronomists to ensure that farmers are well-informed on impending threats, or when a pest is not likely to be a concern in their area.

Phelps says these products are used where it is most effective, with the least impact on non-target or beneficial insects. "Applying product to seed means that the product is there to protect the seed and seedling from predators," she says, while minimizing the impact on other insects.

Cultural Controls

Carefully considering when to use seed treatments is one aspect of integrated pest management, but cultural controls can also prove useful in the fight against insect

What Products Are Affected?

You likely know neonicotinoid products by their trade name, but the active ingredients currently under review and possible phase-out include imidacloprid, clothianidin, and thiamethoxam.

According to Sherrilyn Phelps, pulse and soybean growers may be using these products as Stress Shield® 600, Admire® SPT, Alias® 240 SC, Trilex® EverGol® Shield (which contain imidacloprid), and Cruiser® 5FS, CruiserMaxx® Vibrance® Beans, CruiserMaxx® Vibrance® Pulses (which contain thiamethoxam).

Phelps says that these products are not just valuable tools — they are, in some cases, the only insecticide tools available for specific pests and crops. In the case of pea leaf weevil and wireworm, neonicotinoid seed treatments may be the only registered option for suppression or control, depending on the crop, or may be the most effective at protecting the plant.

pests. If neonics are phased out, the pests do not go away, so farmers are going to be dependent on these other methods to protect their crops.

There are several Prairie research projects underway to both evaluate the effectiveness of cultural controls against neonic-targeted pests, and also practices that could steward the use of these products, should PMRA consider maintaining access.

The pulse industry is hopeful that a Prairie-based, replicated scientific trial looking at the impact of vegetative buffer strips to reduce neonic movement to waterways may be considered in the PMRA re-evaluation. An Eastern Canadian research project into this work found vegetative strips were not effective, however.

There is also significant effort underway to evaluate the use of lure or trap crops for pea leaf weevil, an insect that actually prefers faba beans to peas. Researchers are also looking at using a yellow mustard plow-down crop to mitigate larval feeding on pea roots.

Some of this research is looking at how farmers can best use neonics and/or foliar insecticides for targeted pests, and some is for a "what-if" scenario of losing access to this group of insecticides.

Whatever the decision, farmers may have to adapt quickly to a rapidly changing pesticide access landscape. ■

Lyndsey Smith writes from the Ottawa Valley and can be found across social media platforms as @realloudlyndsey

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Winter Grower Events

There are a number of extension events happening from January to April for all growers in the province to take part in

BY SASKATCHEWAN
PULSE GROWERS STAFF

WINTER IS THE BUSIEST TIME for agricultural conferences and meetings focused on production, sustainability, technology, markets, and a host of other topics geared towards enhancing and improving your own operations.

Here are a few extension events coming up that you should watch for:

CropSphere 2019

January 15 & 16, 2019

CropSphere 2019 will feature keynote speakers presenting on relevant topics in politics and in equipment repair. Former Saskatchewan premier Brad Wall will be discussing trade, in particular how current trade agreements and the political landscape, is impacting Canada's trade position. Farmer activist Tom Schwarz from Nebraska will be at the conference to speak about the growing right to repair movement. This issue has seen increased profile in the United States (U.S.) as growers battle with equipment companies over who has the right to repair new equipment. Schwarz will share what he has learned from the situation in the U.S. so that growers can do more to educate themselves on the situation in Canada.

There are a number of crop-specific sessions at the conference that are filled with information that can influence growers' home operations. Steve Laroque will be presenting on compaction in soil and controlled traffic farming. Dr. Tyler Wist will be presenting on wheat midge and what growers can do to mitigate this insect pest in their wheat crops. William May and Michelle Hubbard will be presenting their research into intercropping and how this practice affects plant disease in rotations, and Melissa Silvernagel will be presenting on best agronomic practices to grow barley in Saskatchewan.

Pulse sessions include the latest pulse crop prices and market expectation information from Chuck Penner of LeftField Commodity Research. Soy Canada as well as Eric Shaw from Corteva (Pioneer) will be presenting on low protein soybeans in Western Canada and what is being done in the research world to address the problem, as well as what Soy Canada is doing for market access for Canadian soybeans. Sherrilyn Phelps will be presenting on the issues growers are facing with root rots and kochia in their pulses, and what steps they can take in their own operations to help mitigate these problems.

Members from canola, cereals, and pulses will be presenting on the Keep it Clean! campaign, a joint initiative that keeps growers and industry informed on proper use of crop protection products, so that residue is not left on harvested seed, maintaining Canada's reputation as a quality grain supplier. The deadline to register is January 4, so secure your seat now at cropsphere.com.

Select Seed Grower Meeting

January 17, 2019 Saskatoon

The annual Select Seed Grower Meeting will take place on Thursday, January 17, 2019, at the Saskatoon Inn & Conference Centre.

Growers can expect to learn what is new with the Crop Development Centre's pulse varieties, get updates on the 2019 Variety Release Program, and receive the latest information on current topics of interest. This meeting is open to Select Status cereal/pulse growers and Foundation canola/mustard/rapeseed growers.

Advanced registration is requested. Please email Cheryl Gore at cgore@saskpulse.com to register for this meeting.

Speak Up! Speakers Training

January and February, 2019

The Saskatchewan Ministry of Agriculture will be partnering with Farm & Food Care Saskatchewan to present these workshops designed to help those who work in agriculture find the right words to talk about the industry.

Please contact the organizers below to register yourself for training at the location nearest you.

- January 22 — Moose Jaw (Jaycee Purcell, 306.694.8999)
- January 24 — North Battleford (Trish Johnson, 306.446.7479)
- January 31 — Yorkton (Rachel Kraynick, 306.786.1529)
- February 5 — Weyburn (Ken Evans, 306.848.2847)

Saskatchewan Ranch Management Forum

February 1-3, 2019 Prince Albert

This three-day event focuses on all areas of ranch management. Topics include farm structure and ranch HR 101, remote livestock water monitoring and water quality, bull selection and EPDs, cattle market update, the do's and don'ts of cattle marketing, funding for producers, a stock handling demonstration, and much more.

This event will take place at the Prince Albert Golf and Curling Club. To register for this event, or for more information, please contact: 306.953.2363.

Winter Regional Pulse Meetings

February 4-7, 2019

SPG and the Saskatchewan Ministry of Agriculture (SMA) will be bringing the annual Winter Regional Pulse Meetings to the communities of Rosetown, Swift Current, Assiniboia, and Regina.



Darrell Bricker, head of Ipsos Public Affairs, presents at CropSphere 2018.

The focus of this year's meetings include insect pests like the pea aphid and pea leaf weevil. James Tansey, Provincial Specialist, Insect/Vertebrate Pest Management with the SMA will talk about the best ways to handle these pests in pulse crops and what pests to expect for the 2019 growing season. Marlene Boersch of Mercantile Consulting Venture Inc. will be sharing pulse crop price updates and expectations of what the pulse market might do in her pulse market update.

Sherrilyn Phelps will be presenting on the growing concern of root rots and kochia affecting pulse crops and what agronomic steps can be taken to handle both. Dr. Tom Warkentin, Plant Breeder from the Crop Development Centre at the University of Saskatchewan will give a variety update on all pulse crops, detailing the top performers in each class, and what new varieties to expect, and Crops Extension Specialists with SMA will discuss diseases, soil testing, and soil fertility specific to pulses grown in each region where meetings are held.

Registering for this event is as simple as contacting the Ag Knowledge Centre at 1-866-457-2377 or aginfo@gov.sk.ca.

Top Notch Oilseed Meetings

This event, hosted by SaskCanola, the Saskatchewan Ministry of Agriculture, SaskFlax, and Canola Council of Canada's Agronomy Team invites producers to discuss the topics of oilseed agronomy, markets, farm management, and more. The 2019 dates are as follows:

- February 6 — Lloydminster
- February 7 — North Battleford
- February 8 — Swift Current
- February 12 — Melfort
- February 13 — Humboldt
- February 14 — Davidson

Check back to saskcanola.com for more information.

Agri-Visions

February 13 & 14, 2019 Lloydminster

This two-day interactive information event brings together both livestock and grain producers for a tradeshow, keynote speakers, seminars, demonstrations, and special events for the agriculture industry. For more information about this event, visit lloydexh.com/agri-visions/.

Soil Management and Sustainability Summit

February 26, 2019 Saskatoon

The Soil Management and Sustainability Summit aims to understand soil management and sustainability for high yields and a better return on investment.

Experts from across Canada and the United States will cover such topics as precision farming and equipment management, soil health, intercropping, cover crops, and soil fertility management.

This conference will be held in downtown Saskatoon at TCU Place. For more information about this event, or to register, visit topcropsummit.com.

Celebrating Rural Ranching Women

February 28 & March 1, 2019 Maple Creek

The Saskatchewan Ministry of Agriculture will be celebrating ranching women across the province.


For more information on this event, please contact Jessica Smith at 306.778.8289.

Soils and Crops 2019

March 5 & 6, 2019 Saskatoon

The annual Soils and Crops Workshop is a two day event offering updates on current research being conducted in the areas of soils, crops, and economics by researchers, faculty, and graduate students from across Western Canada. The second day offers a workshop based on invited presentations, designed to provide in-depth training on a variety of topics emphasizing agronomy.

The Saskatchewan Institute of Agrologists (SIA) and the Certified Crop Advisor (CCA) program recognize this event as a professional development opportunity. For more information on the workshop, speakers, and how to register, please visit the event website: usask.ca/soilscrops/.



IDEAS, INNOVATION AND KNOWLEDGE

CROSPHERE 2019 - JANUARY 15 AND 16

Location: TCU Place, Saskatoon (35 22nd St E)
Hosted by: SaskBarley, Saskatchewan Pulse Growers, SaskFlax, SaskCanola, SaskOats, and Sask Wheat

FEATURING SPEAKERS:

Brad Wall
Former leader of the Saskatchewan Party and 14th premier of Saskatchewan

Katie Dilse
North Dakota farmer and motivational speaker

Michael Landsberg
Former Host, TSN's *Off the Record* and mental health advocate

And many more!


REGISTRATION:

Regular registration:
\$225 - Available from December 1, 2018 to January 4, 2019

Registration at the door:
\$250

One-day registration:
\$225

For more information visit **CROSPHERE.COM**

 @CropSphere

Think Wheat Meetings

March 11-15, 2019

The Think Wheat meetings, hosted by Sask Wheat, are aimed at providing Saskatchewan wheat producers with the most up-to-date and relevant agronomic and marketing information to assist them in maximizing the return on their wheat and durum crops. Speakers and topics are still evolving, so please go to saskwheat.ca for more information.

Croportunities 2019

March 13, 2019 Swift Current

This one-day event covers results and research that has been conducted at the Wheatland Conservation Area.

For more information on speakers and topics or to register for this event, please contact: Shannon Chant at 306.778.8291.

On Point

SPG Director Election Results

Three people have been acclaimed to the Saskatchewan Pulse Growers' (SPG) Board of Directors following the close of nominations in mid-September. Chad Doerksen of Dalmeny and Shaun Dyrland of Kyle will join the Board of Directors in January, and Trent Richards of Assiniboia will continue into his second term on the Board.

SPG Board of Directors Profile



Chad Doerksen

Chad Doerksen farms 28 kilometres north of Saskatoon near the town of Dalmeny. He began farming after taking over his grandfather's portion of the farm

in 1997. In the early 2000s Chad bought out his father's portion of the farm, growing his operation to 8,000 acres. He grows canola, HRS wheat, oats, soybeans, lentils, and yellow peas, which equates to 15 to 20 per cent of his operations consisting of pulses.



Shaun Dyrland

Shaun Dyrland has been active in the family farm west of Kyle for the last 20 years, growing the operation to 15,000 acres with his brother and father. They

produce lentils, field peas, and chickpeas on approximately 50 per cent of the land, with

the balance being made up of durum wheat and canola.

New Director of Research and Development



Dave Greenshields

SPG welcomed Dave Greenshields in the role of Director of Research and Development in August. Previous to joining SPG, Dave worked for

Novozymes BioAg Ltd., as Senior Business Development Manager for Asia Pacific, Africa, and Europe, developing markets for Novozymes products. He also held the roles of Commercial Product Development Manager, North America, R&D Manager, Canada, and Senior Scientist. Prior to Novozymes, Dave worked at the National Research Council, Plant Biotechnology Institute in Saskatoon, The Sainsbury Laboratory in the United Kingdom, and RIKEN Plant Science Centre in Japan. In these roles, he worked on canola genetics, plant pathogen genomics, among others. Dave holds a PhD in Biology from the University of Saskatchewan.

SR&ED Tax Credit

Growers who contribute pulse levy dollars to Saskatchewan Pulse Growers (SPG) are eligible to earn a federal investment tax credit through the Scientific Research and Experimental Development (SR&ED) program. The tax credit is based on the amount of levy funds spent on research and development (R&D) that meet specific criteria set out by the Canada Revenue Agency (CRA).

For the 2018 tax year, 94 per cent of the Saskatchewan pulse levy qualifies for the federal SR&ED tax credit. The SR&ED tax credit is high for 2018 due to the fact that SPG's levy revenues have dropped in the past year, and this tax credit is a percentage of overall levy. Long-term research and development funding commitments have not changed relative to the drop in levy income, hence the higher SR&ED percentage for 2018.

Upcoming Events

Saskatchewan Pulse Growers Annual General Meeting

January 14, 2019 Saskatoon

The SPG annual general meeting will be held Monday, January 14, 2019 in Galleries C & D at TCU Place, downtown Saskatoon (35 22 St E, Saskatoon) beginning at 5 p.m. You do not need to be registered for CropSphere to attend the AGM. Cash bar and light refreshments to follow.

2017/18 Annual Report

Find SPG's 2017/18 Annual Report online at saskpulse.com

For recent news on the pulse industry, visit the SPG website at saskpulse.com

Grower Profile

Jeff Ewen,
Riverhurst,
Saskatchewan

PULSE CROPS GROWN: DRY BEANS, LENTILS,
PEAS, CHICKPEAS, AND SOYBEANS



What attracted you to growing dry beans?

We started growing dry beans when we acquired irrigation about 10 years ago. We were looking at our crop rotations and what other

irrigators in the Riverhurst area were doing. The pulse in rotation that had potential for the highest returns for local farmers was dry beans, so we decided to try beans in our rotation.

It was a steep learning curve for us but we had the benefit of access to a lot of local knowledge. The first thing we did was throw in a quarter of dry beans to see how they did. We learned a lot about growing dry beans under irrigation from a custom equipment operator in Riverhurst. He was formerly from Idaho and has a long history of growing dry beans. He moved up to Saskatchewan, bringing the equipment and knowledge with him, which has helped expand dry bean production in the Lake Diefenbaker area.

Bean agronomy was hard to find information on at first, so we worked with our buyers (Viterra in Alberta), and they provided an agronomist contact that we could bounce questions off of at any time. Now, with a few years of growing beans under our belts, we

just call our agronomist to give an update on what is going on with watering, fertility, and disease in our dry bean crops. This has evolved over the years to where we feel we now have a handle on dry bean agronomy and what our crop needs.

Do you grow other pulse crops?

Our family has had pulses in our rotations all of my life. In the past we grew lentils (green and red), peas (green and yellow), chickpeas, and soybeans. We had to move away from growing peas because of root rot issues. For now we will stick with growing lentils on dryland and dry beans on irrigation, and maybe in the future we will try faba beans. Dry beans have offered us the best fit for irrigated production and also for offering partial resistance to root rot diseases.

What variety/varieties of dry beans do you grow?

Currently we are growing Pinto beans (AC Island, which is the preferred variety contracted through Viterra). We also grow CDC Blackstrap, which is a black bean variety available to growers. In the Riverhurst area there are many other varieties of dry beans that are being grown. Dry bean marketers say there is room for growth in the market and many of the traditional dry bean growing areas in North America have acres being displaced by soybeans. They are a pulse crop that I

would like to see grow in acres to sustain a processing industry in Saskatchewan.

What challenges have you encountered growing dry beans?

Disease is always a problem with growing dry beans, and with irrigation we know that we invite the environment that disease thrives in. We spray two fungicides and do a lot of crop scouting throughout the growing season. White mould and bacterial blight are the two most common diseases we encounter growing beans. Frost is a problem when growing dry beans, so they are higher risk to grow in the north. Rainfall is needed, so production in the south is also higher risk.

We have learned throughout the years that dry beans are delicate seeds and they need a lot of consideration throughout the year. Specialized dry bean planting, handling, and harvesting equipment is available to maximize production and minimize loss or seed damage, but the cost of investing in specialized equipment can only be considered with larger acres of beans.

Adverse weather conditions during harvest, can result in lower quality dry beans. Some classes of dry beans also degrade in storage and should be shipped directly to a processor after harvest to receive top quality. Fortunately, black beans are known to hold their quality much better than other classes in the case of poor harvest

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weather and longer-term storage. Marketing for dry beans is one province over to the east or west. There is one processor in Saskatchewan but marketing opportunities seem to be stronger in Manitoba or Alberta.

What are some of the benefits of growing dry beans that growers may not be aware of?

Dry beans offer another rotational option, specifically another pulse option. Depending where you are in Saskatchewan dry beans can be a real opportunity, especially growing them under irrigation. There are relatively good herbicide options for weed control as dry beans use similar products that are used on peas, which helps break the Group 2 issues. Dry beans are relatively efficient water users until the reproductive stage when they require the majority of their moisture requirement. They do not like

standing water, but they do handle moisture better than some other pulses.

What is your long-term vision for dry bean production?

In the large picture there is plenty of opportunity here to grow dry bean acres and production. They are the largest traded pulse crop in the world. The marketability and the ease of export is huge, and gives growers a lot more flexibility. The vast amount of market classes for dry beans gives growers more opportunities to capture different markets, and reduce their risk. Lately soybeans have been putting pressure on dry bean production areas, especially in Manitoba. This shows a shift in acres that Saskatchewan could capitalize on. As well, marketers see a lot of room for Canada to expand acres and market dry beans worldwide.

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