ALBERTA CANOLA
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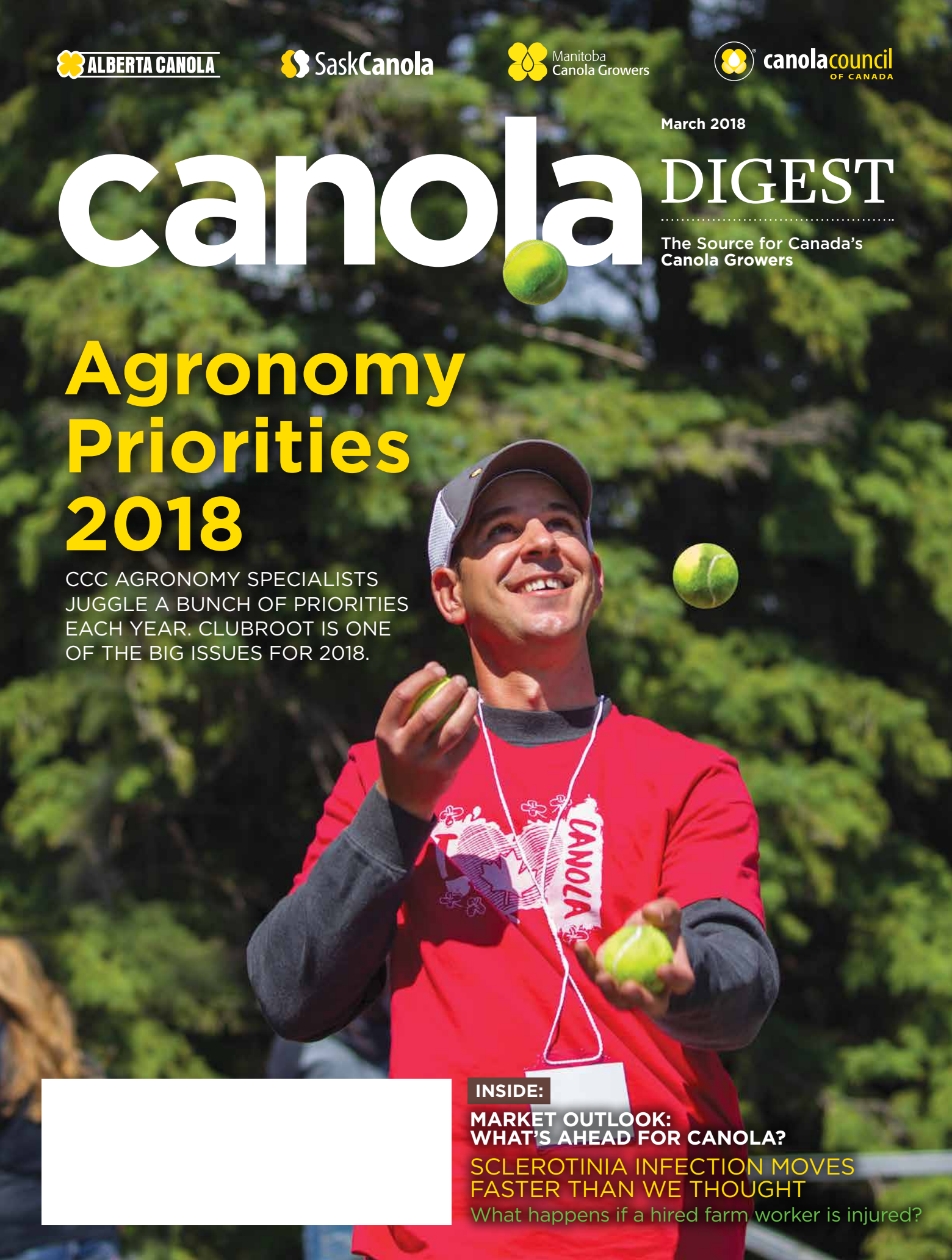
March 2018

canola DIGEST

The Source for Canada's Canola Growers

Agronomy Priorities 2018

CCC AGRONOMY SPECIALISTS JUGGLE A BUNCH OF PRIORITIES EACH YEAR. CLUBROOT IS ONE OF THE BIG ISSUES FOR 2018.



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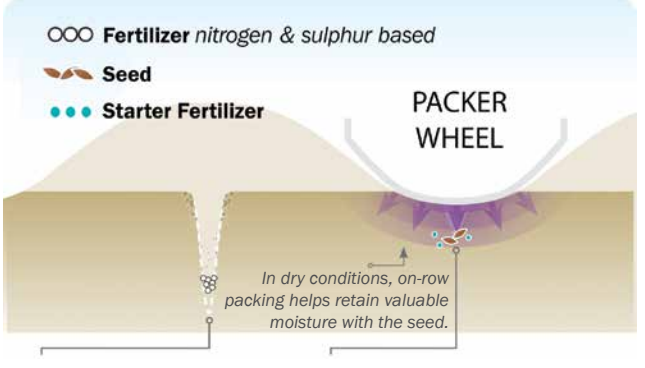

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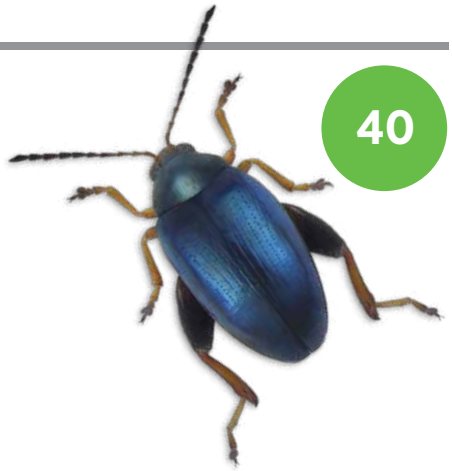

PROVINCIAL BULLETINS

CALENDAR

CANOLA COUNCIL OF CANADA CONVENTION
March 6-8 | Palm Springs, California
convention.canolacouncil.org

MANITOBA CANOLAB (FEATURING SOYLAB)
March 14 | Brandon, Manitoba
March 15 | Dauphin, Manitoba
canolagrowers.com/events

COVER YOUR ASSETS: MARKETING AND BUSINESS MANAGEMENT WORKSHOP
March 22 | Brandon, Manitoba
canolagrowers.com/events

CANOLAPALOOZA
June 25 | Saskatoon, Saskatchewan
saskcanola.com/news/upcoming.php

CANOLAPALOOZA
June 28 | Lacombe, Alberta
albertacanola.com/event/canolapalooza

2018 INTERNATIONAL CLUBROOT WORKSHOP
August 7-9 | Edmonton, Alberta
canolacouncil.org/what-we-do/upcoming-events

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[1] All comparisons are to untreated, unless otherwise stated.

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Royal family

Chuck Penner, in his canola outlook in this issue, forecasts Canadian canola acres at 23.75 million, another record for queen canola. Is this too many for long-term canola sustainability?

Think back to 2014. The Canola Council of Canada launched its Keep It Coming strategy, with a target of 52 bu./ac. average yield and a production and sales target of 26 million tonnes per year by 2025. The sales target was (and is) on track with market-growth trends. The high-yield goal was (and is) necessary to meet sales targets and keep acres in check.

In the strategy, acres are pinned at 22 million, considered at or near the top end for long-term sustainability. Just look at the clubroot situation in 2017 and the heavy priority on clubroot management among CCC agronomy specialists for 2018 as one example of the link between rotation and sustainability.

A March 2014 *Canola Digest* article on Keep It Coming includes this line: "This [target] is not about adding substantially more acres of canola. It's about using science and innovation to get more from the acres we sow." That is still true today, but this strategy relies on strong markets and strong returns for pulse, cereal and other crops in the rotation. But two big rotation crops for canola – wheat and peas – face their own pressures.

India's tariff on pulse imports does not help Canada's princely pea acres, which can work very well, both economically and agronomically, in a rotation with canola. The down-shift in king wheat acres in Western Canada is not helpful to a sustainable rotation.

In her cereals market outlook at CropSphere in Saskatoon in January, Marlene Boersch of Mercantile Consulting Venture in Winnipeg presented the graph at the bottom of this article.

"This slide could and does indicate Canadian farmers' ability to adapt to market signals, especially with regard to canola and pulses," Boersch says. "But given clear increases in internationally-traded wheat volumes in recent years, it may also show that we are simply losing competitiveness in this market – which is due to all kinds of factors. I don't think Canada still has a leadership role in wheat markets."

Canadian wheat needs its groove back.

Market access and market development are priorities for an export-driven nation like Canada. They always have been, and as long as we remain a country where production of canola, cereals and pulses widely outstrips domestic demand, they will remain so. Canada also needs to maintain international competitiveness and high standards for quality and reliable, safe supply. This is as true for wheat and peas as it is for canola.

On rotations, my colleague Angela Brackenreed noted recently that the economic return for a rotation cannot simply be broken down into individual crops. The disease break from cereals and pulses and the increase in available nitrogen that pulses can provide will both help canola yields immensely, but when we run economics these benefits are often gathered up entirely in the canola yield and profit equation, she says. That isn't fair to the rotation crops.

The benefit of diversity that comes from a crop rotation is not about competition between individual crops. A rotation is a farming system greater than the sum of its parts. Forget about acreage crowns passing from king wheat to queen canola, and about baron barley, prince pea and lord lentil (I could go on) fighting for heir apparent. Long-term sustainability of all crops and all grain farms in Canada depends on a strong royal family.

Biggest increases in wheat production in the past five years

Country	Production 2017*	Production five years ago*	Percent change
Russia	83	52	60
Australia	35.1	23	53
China	130	121.9	6.6
Argentina	17.5	10.5	67
India	98.5	93.4	5.3
Ukraine	26.5	22.2	19
Canada	30	37.5	-20
Total	755	715	5.6

Source: Marlene Boersch, Mercantile Consulting Venture *million tonnes

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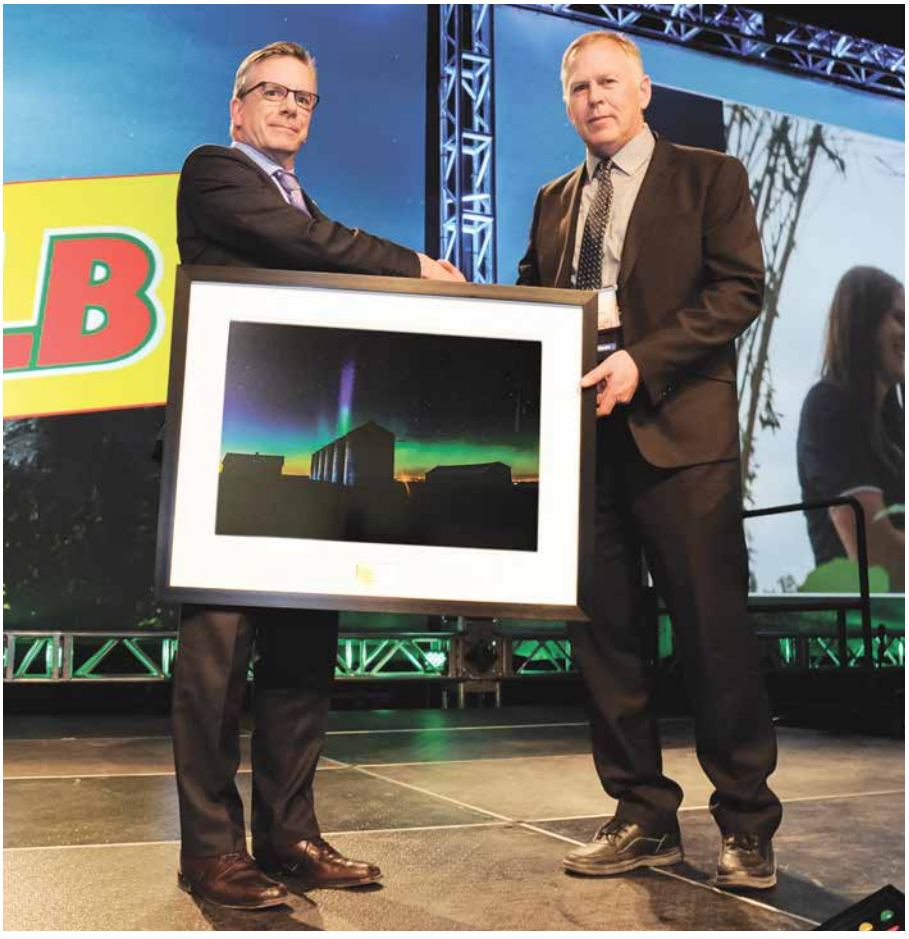
Scott Meers wins the 2018 Farmtech Award

Alberta Canola congratulates Scott Meers on receiving the 2018 FarmTech Award for his outstanding contributions to the cropping sector of agriculture in Alberta. Scott is the Insect Pest Management Specialist for Alberta Agriculture & Forestry and is responsible for Alberta's Insect Pest Monitoring Network.

Scott has been helping Alberta's canola growers understand and manage insect pressure while increasing awareness and knowledge of the many beneficial insects at work in canola fields. Scott often speaks at Alberta Canola events including canolaPALOOZA, canoLAB, and on the Powering Your Profits Tour.



Rick Taillieu of Alberta Canola presents Scott Meers with the FarmTech Award and a George Clayton Photography print.

Thank you to Greg Sears & Steve Marshman

GREG SEARS

STEVE MARSHMAN

The board of Alberta Canola would like to thank outgoing directors Greg Sears and Steve Marshman for all the hard work they have done on behalf of Alberta canola farmers.

Greg joined the board in 2012 and held many positions including Alberta representative to the Canola Council of Canada. Greg was chair for the last two years and the board has greatly appreciated his steady hand at the helm and his unflappable demeanor.

Steve joined the board in 2015 and represented farmers' interests at the Clean Air Strategic Alliance. Steve brought a wealth of business experience to the board and this will be missed.

Both men were also heavily involved in presenting farmers' opinions to the government during Bill 6 consultations.

Once again, the board would like to thank Greg and Steve for their service and dedication, and a special thank you to their families for sharing them for the advancement of our remarkable industry. All the best in the future!

Alberta Canola elects new chair and new vice-chair

Back L-R:
Dale Uglem, *Bawlf*
Ian Chitwood, *Airdrie*
Cale Staden, *Vermilion*
Kevin Serfas, *Turin*
Dan Doll, *Fairview*
Denis Guindon, *Falher*

Front L-R:
Brian Hildebrand, *Foremost*
John Mayko, *Mundare*
Andre Harpe, *Valhalla Centre*
Renn Breitkreuz, *Onoway*
John Guelly, *Westlock*
Mike Ammeter, *Sylvan Lake*

Alberta Canola's 28th Annual General Meeting was held January 30 at the FarmTech Conference in Edmonton. Following the meeting Renn Breitkreuz of Onoway was elected as Chair, and John Guelly of Westlock was elected Vice-Chair.

Joining the board are Andre Harpe of Valhalla Centre, who replaces Greg Sears of Sexsmith for Region 1, and Ian Chitwood of Airdrie, who replaces Steve Marshman of Strathmore in Region 8.

Tax Credit for the 2017 Tax Year Open to Alberta Canola Producers

Credit: iStock.com/urfinguss

Canola growers in Alberta that do not request a refund of their check off from the Alberta Canola Producers Commission qualify for a tax credit for the 2017 tax year. The Scientific Research and Experimental Development (SR&ED) tax credit allows canola growers to claim the tax credit for that portion of the check off paid that was used to fund qualifying research. For full details visit **albertacanola.com/sred**.

Save the Date!

CANOLAPALOOZA RETURNS TO LACOMBE JUNE 27, 2018.

What is canolaPALOOZA, you ask? It's a day that brings the best research and agronomy extension experts from across the country into one field in Alberta, for a day of interactive, hands-on, in-field learning where you move through learning stations and demos at your own pace. To learn more about this unique event visit **albertacanola.com/palooza**.

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Back L-R:
***Lane Stockbrugger**, Englefeld*
***Bernie McClean**, Glaslyn*
***Gerry Hertz**, Edenwold*
***Doyle Wiebe**, Langham*

Front L-R:
***Wayne Truman**, Redvers*
***Charlene Bradley**, Stranraer*
***Keith Fournier**, Lone Rock*

SaskCanola Maintains Current Leadership

Following SaskCanola's Annual General Meeting on January 8, the SaskCanola Board of Directors voted to maintain current leadership for the 2018 year with Doyle Wiebe as Board Chair and Lane Stockbrugger as Vice-Chair. For further information about SaskCanola board committees and external appointments, visit **saskcanola.com/about/directors.php**.

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SaskCanola Commits $1.5 Million to Collaborative Canola Research

SaskCanola has committed $1.5 million to support 10 new research projects funded under the Saskatchewan Agriculture Development Fund (ADF) in 2018. Some of the projects include: understanding clubroot populations, monitoring soil organic carbon in direct seeded fields across Saskatchewan, defining best management practices for using supplemental heating with natural air drying, understanding canola root rot systems and nutrient uptake, and understanding the role of plant hosts during outbreaks of the aster leafhopper vectored aster yellows. At CropSphere on January 9, Saskatchewan's Minister of Agriculture, the Hon. Lyle Stewart, announced that the government will be investing $7,730,038 into 30 crop-related ADF projects in 2018.

"SaskCanola is always looking for ways to maximize producers' investment. Funding partners are key to this so we really appreciate the government's sustained investment and continued support of the agriculture industry," stated Janice Tranberg, SaskCanola Executive Director.

To view currently funded SaskCanola research & project results, visit **saskcanola.com/research**.

Credit: Tyler Wist, AAFC

Bill Cooper Receives Canola Influencer Award

To commemorate our 25th year as SaskCanola, from 2016-17 onward, the Canola Influencer Award will be annually bestowed upon a member of the agricultural community that has made significant contributions of knowledge, education, and ongoing efforts to promote canola. The first recipient of this award was one of the 'fathers of canola', Dr. Keith Downey. This year, the SaskCanola Board voted for William "Bill" Cooper to be the second recipient of this award.

Bill Cooper was very proactive in the early years of canola production and processing in the province through his participation as a Director on the Board of the Saskatchewan Canola Growers Association and then as Executive Director of the SCGA from 1978 to 1987. He was instrumental in many policy discussions including those related to grain transportation and used his knowledge to further discussions about moving canola to market efficiently and economically.

SaskCanola Board Chair, Doyle Wiebe, presents William Cooper with the Canola Influencer Award.

Bill's engagement with the canola industry has been long-term. He has consistently provided leadership and guidance during a time when canola was a fledgling crop that required an advocate and a champion. A farmer himself, from Foam Lake, he has worked to improve the business of farming in Saskatchewan and that impact has been felt across western Canada.

It was SaskCanola's distinct pleasure to honour and recognize Bill's accomplishments as we presented him with the Canola Influencer Award at our AGM on January 8. Congratulations and thank you Bill!

canolaPALOOZA Returns to Saskatoon

Save the date for June 25, 2018, when canolaPALOOZA returns to Saskatoon. An event that brings the best research and agronomy extension experts from across the country into one field in Saskatchewan for a day of interactive, hands-on, in-field learning where you move through stations and demos at your own pace.

Entomologist Boyd Mori talks insects with a farmer at canolaPALOOZA 2017.

Credit: iStock.com/destillat

Research Tax Credits for Saskatchewan Canola Producers

The Scientific Research and Experimental Development (SR&ED) Program is a federal government program that encourages research and development by providing tax-based incentives. By using levy contributions to finance research and development work that benefits Saskatchewan canola producers, SaskCanola is able to participate in this program and distribute these tax-based incentives back to producers. For complete details on how you can apply for these tax credits, visit **saskcanola.com/research/taxcredit.php** or contact the SaskCanola office at 1-877-241-7044.

Canola Award of Excellence 2018

In 2017, for the first time in the history of Canada, the number of acres seeded in canola exceeded those planted in wheat. Canadian farmers sowed 22.8 million acres of the oilseed crop in 2017, effectively dethroning what had been the iconic crop of the country.

The meteoric rise of canola all started on a handful of plots and with growers like Murray McConnell, recipient of the 2018 Canola Award of Excellence from the Manitoba Canola Growers Association (MCGA).

McConnell farms near Teulon, Manitoba, only about 40 kilometres from where Baldur Stefansson, one of the fathers of modern canola, lived. The McConnell family had been in the seed business since 1938, so it was natural for Stefansson to reach out with his new project in the late 1970s.

"We received canola breeder seed from Stefansson to grow in a seed plot," says McConnell, 85. "I still have the letter he had sent with the seed and, for that reason, I believe that we were one of the earliest seed producers to grow it."

While McConnell doesn't recall exactly how that first crop fared, he does remember the amount of work that went into the project.

"We were doing a lot of field testing at that point and I can't forget the amount of roguing that was required," he says. "At one point, the Department of Agriculture sent out a dozen people who were learning to be inspectors. They rogued and rogued and I don't think those boys ever worked harder!"

McConnell continues to farm just under 800 acres in a rotation of canola and wheat. But the McConnell family's agricultural roots reach back more than a century.

"My father received some seed barley in 1938 through his sister Edna McConnell, who was attending the University of Saskatoon to obtain her agriculture degree," he said. (Edna eventually became the first female agricultural representative in Canada.) That barley propelled the family into the seed business, which McConnell ran into the early 2000s.

McConnell says it's sometimes overwhelming to think about the changes in farming during his lifetime.

"I distinctly remember walking with my grandfather in the fields when he would be behind the horse and harrow," he says. "The old dog Bob would be right there with us and it was an all-day affair."

MURRAY MCCONNELL

"Today's farmers are so much more technologically savvy. Farms are so big and equipment is expensive. It's certainly a different game from what it used to be."

The Canola Award of Excellence is presented annually to acknowledge the accomplishments of individuals and organizations who contribute to the sustained growth and prosperity of Manitoba's canola industry. The award was first presented in 2008 to Dr. Baldur Stefansson for his work in creating a new edible oilseed which we know today as canola.

"I distinctly remember walking with my grandfather in the fields when he would be behind the horse and harrow. The old dog Bob would be right there with us and it was an all-day affair."

—Murray McConnell

New and Returning Farmers for MCGA board

Results of the 2017 Manitoba Canola Growers (MCGA) election of directors were decided by acclamation. With four board positions up for election and only four nominations submitted, no voting was required for this year's election.

Nominees named to the board of directors are:

CHUCK FOSSAY
Starbuck, MB

CURTIS MCRAE
Selkirk, MB

JOHN SANDBORN
Benito, MB

PAM BAILEY
Dacotah, MB

The results of this year's election will see two new faces sitting around the MCGA board table, each bringing a unique and valuable perspective to the board. John Sandborn is a welcome addition, representing the strong production area in the North West Parkland region of the province. John brings a wealth of board experience having been an elected director for Manitoba Pool Elevators/ Agricore Cooperative and Federated Cooperatives, among several others. Pam Bailey's addition to the board marks a milestone for MCGA as the first female board member, bringing a passion for farm safety, strong technical knowledge of plants and the environment, as well as experience in organizational effectiveness, strategic planning and policy development.

Returning directors Chuck Fossay and Curtis McRae both currently hold executive office and will continue to be strong and active representation for Manitoba farmers.

This year's election sees long time directors Brian Chorney and Ed Rempel come to the end of their maximum term. We would like to thank both Brian and Ed for their dedicated service and invaluable contributions to the canola farmers in Manitoba.

BRIAN CHORNEY

ED REMPEL

Credit: iStock.com/oyoo

Global demand for vegetable oil and meal keeps rising, which is positive for the canola outlook. But what will another rise in canola acres in Western Canada mean for disease and other rotation issues?

MARKET OUTLOOK: WHAT'S AHEAD FOR CANOLA?

BY CHUCK PENNER

Compared to the large swings of the past few years, canola prices so far in 2017-18 have remained fairly stable. (This was written in mid January.) The average Western Canadian bid has moved from a harvest low of $455 per tonne ($10.30 per bushel) to an early November high of $495 per tonne ($11.20 per bushel) and is now somewhere about halfway between. A move of less than a dollar per bushel over the past six months isn't much. But that's already history. The question is what to expect for the rest of 2017-18 and into 2018-19?

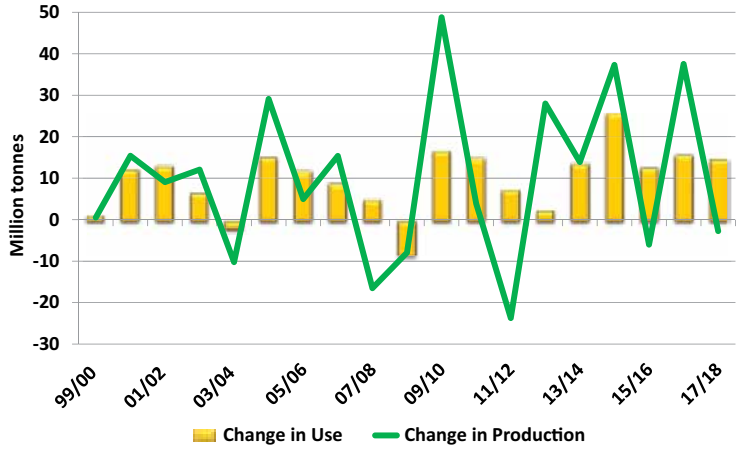
SOYBEANS: WATCHING WEATHER IN SOUTH AMERICA

Soybeans are the overriding market influence for oilseeds. From the big picture perspective, global consumption of soybeans has been increasing at an average of 16 million tonnes per year over the last five years. That's the same growth rate as the average increase in production, but there's a whole lot more variability in year-to-year production, and that adds volatility to the market. (See graph 1.)

Global soybean consumption for 2017-18 is expected to rise another 15 million tonnes while production is forecast to actually slip by three million tonnes. Even so, overproduction in 2016-17 meant a large increase in the carry-in for 2017-18, so supplies still aren't shrinking.

We're already a few months into the 2017-18 soybean marketing year, but outcomes in South America, comprising half the global crop, still aren't decided. Weather in Brazil and Argentina has become the dominant market factor. As of mid-January, the Brazilian crop was looking positive, although there are concerns about excess moisture causing diseases and harvest delays. In contrast, Argentina had been very dry but has since picked up some more moisture.

Graph 1. Change in soybean use and production



Demand for soybeans keeps rising (gold bars show the increase each year) except when production shortages (green line) cause supply issues.

South American crop outcomes will be the largest factors for the rest of 2017-18, especially as they will determine the level of U.S. soybean exports. So far, U.S. exporters have been moving fewer soybeans than last year, raising the potential for larger U.S. ending stocks. That's not helpful for prices. This slower export pace has also triggered commodity funds to build a large short position in soybeans, which has been pressuring futures.

Global soybean consumption for 2017-18 is expected to rise another 15 million tonnes while production is forecast to actually slip by three million tonnes.

Because of the discouraging market situation for pulses, most observers expect Canadian canola acreage to increase. We're certainly in that camp... Disease concerns could limit the acreage increase, so we're forecasting a modest three per cent gain this year. That still means another new record of 23.75 million acres.

STRONG DEMAND FOR CANOLA

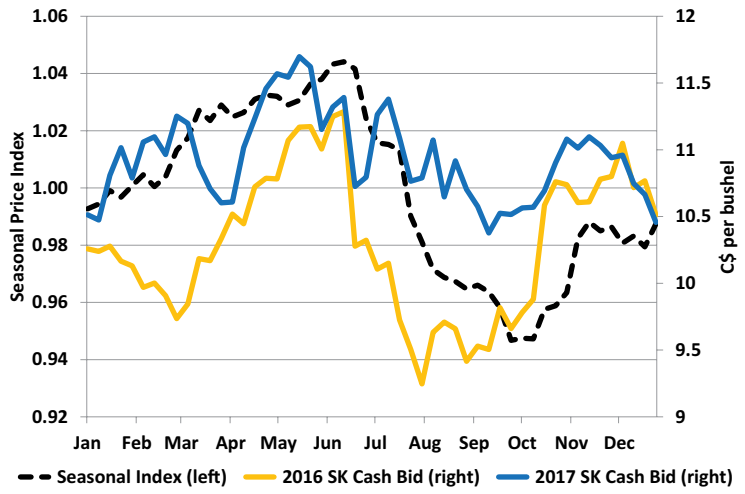
Canola has been feeling that spillover pressure from the soybean market, causing prices to decline late in 2017. Even though there's not a whole lot of fresh news for canola as we roll into the beginning of 2018, there is some room for optimism based on seasonal tendencies. Typically, canola cash prices tend to move higher until mid-June with help from futures but also narrower basis levels. Early in both 2016 and 2017, there were a couple of dips but overall, prices followed those seasonal patterns fairly closely. (See Graph 2.)

Even though Canada's 2017 canola crop was a new record, there's no reason to think the same seasonal tendencies won't show up in early 2018. Canola crushing so far in 2017-18 has been following last year's record pace and canola exports (as of mid-January) are running at a new record. While a lot of the focus has been on Chinese demand, exports to Japan and Mexico have also been well ahead of last year. That solid usage means a steady pull of canola through the elevator system and continued price support.

SEEDED ACRES FOR 2018-19

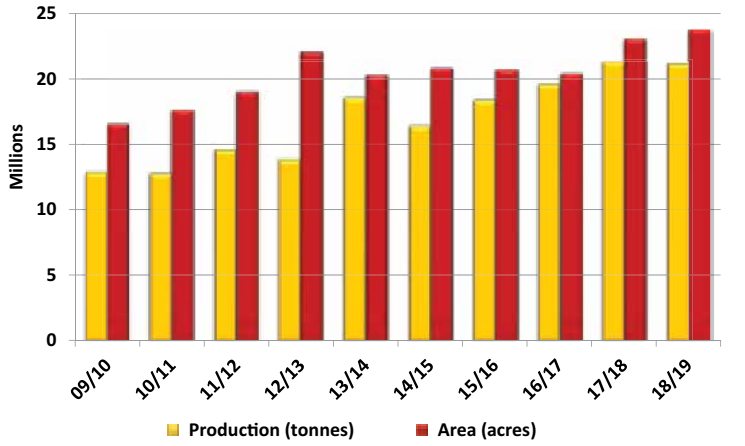
The look ahead to 2018-19 starts with ideas about this spring's canola and soybean seeded area. Because of the discouraging market situation for pulses, most observers expect Canadian canola acreage to increase. We're certainly in that camp. When we compare projected 2018 returns for canola versus other crops, canola comes out near the top. Disease concerns could limit the acreage increase, so we're forecasting a modest three per cent gain this year. That still means another new record of 23.75 million acres. (See Graph 3.)

Graph 2. Seasonal price index - Canola



The price index (black line) shows the historic rise and fall of canola cash prices over the year. Saskatchewan prices for 2016 (yellow) and 2017 (blue) follow roughly the same shape, and a similar pattern is expected for the first part of 2018.

Graph 3. Canadian canola area and production



Canadian canola area could rise to 23.75 million acres in 2017, an all-time high. Good canola returns and the discouraging market situation for pulses are driving the forecast increase.

For more canola market stats, go to **canolacouncil.org** and look under the "Markets & Stats" heading.

If the 2018 canola yield ends up close to the five-year average, Canadian production would be very close to the 2017 crop, leaving 2018-19 supplies essentially unchanged. On the consumption side, canola crush won't change all that much as industry capacity stays the same. Exports will likely continue to expand as that's been the consistent trend over the past five years. Based on all these assumptions, Canadian canola 2018-19 ending stocks could actually end up a little tighter than the current marketing year.

GLOBAL PRODUCTION

On its own, this Canadian outlook for 2018-19 should help support prices but developments in other countries

for both soybeans and canola/rapeseed need watching. Those same market signals that will encourage Canadian canola acreage are also visible in other countries. Rapeseed is mainly a winter crop in Ukraine and the European Union and acreage already planted for the 2018 harvest is estimated to be steady or higher. Later this spring, plantings will likely be higher in Russia and Australia, two other key export competitors.

Despite this increase in seeded area, global supplies of canola/rapeseed won't expand all that much (assuming average yields). This means the canola portion of the oilseed outlook isn't going to become burdensome and that should be supportive for new-crop prices.

As always, soybeans will dominate next year's oilseed outlook. Here in Canada, soybean performance in parts of the Prairies was less than stellar in 2017 and that could cause 2018 seeded area to plateau. But that's hardly going to cause a ripple in the market.

The three dominant players in soybeans are the U.S., Brazil and Argentina, which together account for 80-85 per cent of global production. In the U.S., observers are already forecasting another small increase in 2018 soybean acreage as it seems to be penciling out a little more favourably than corn, causing acres to shift.

Even if acreage of soybeans and canola is higher in 2018, yields also need to be average or better to maintain adequate supplies as there's little "wiggle room" for crop problems in 2018-19.

In South America, the 2017-18 crop is still out in the field so it's far too soon to forecast next year's acres. That said, Brazil has been steadily increasing acreage for years and there's no reason to suspect that trend will change based on current market dynamics.

The main thing to keep in mind is that the world needs larger supplies of oilseeds every year, both for the oil and the meal. Production needs to keep expanding to meet that demand. Even if acreage of soybeans and canola is higher in 2018, yields also need to be average or better to maintain adequate supplies as there's little "wiggle room" for crop problems in 2018-19.

This means (just like every year) the outlook is largely in the hands of the weatherman. And, like most years, there are already some concerns. In Western Canada, soil moisture is extremely low, especially in central Saskatchewan. Farmers in Ukraine are also worried as (through mid-January), their winter rapeseed crop has no real snow cover. While it's too soon to draw any conclusions about the 2018-19 soybean crop, even the Argentine crop currently in the field faces challenges due to dry weather. These potential problems can still be resolved, of course, but they're worth watching.

Based on assumptions of "normal weather," the price outlook is relatively friendly, but despite all the economic analysis, weather still trumps all other factors in the outlook.

— Chuck Penner has 25 years of commodity markets experience and is the founder of LeftField Commodity Research in Winnipeg. Contact him through ***leftfieldcr.com****.*

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Canola Council of Canada agronomy specialists describe their key messages for 2018. Clubroot leads the way for many of them.

CANOLA AGRONOMY PRIORITIES FOR 2018

CLINTON JURKE
AGRONOMY DIRECTOR
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Twitter: @JurkeCCC

As a team, we put together five top priority areas for 2018, building on successes, challenges and important developments from 2017.

1. **Set target stands.** Much of a canola crop's success depends on an early-established and evenly-emerging stand of six to eight plants per square foot. To help set a target stand that suits field-risk conditions and a seeding rate that matches target stand, seed size and estimated seed survival, use the tools at **canolacalculator.ca**.

2. **Choose clubroot-resistant varieties.** This is an important tool to keep spore counts down in areas where clubroot is newly confirmed but still at fairly low levels. In areas with clubroot, a two-year or three-year break between canola crops is also essential to reduce spore counts between canola crops. Go to **clubroot.ca** for scouting, prevention and management information.

3. **Scout for blackleg.** Rotate R-genes if necessary. Canola growers who have noticed an increase in blackleg in some fields should rotate to a different source of blackleg resistance on those fields. Find lots more on blackleg management, including the new "Blackleg Disease and Resistance Management" video, at **blackleg.ca**.

4. **Improve overall scouting practices.** Through scouting, canola growers can identify insect, disease and weed issues before they start to cause an economic loss of yield. For comprehensive information on canola pests and other canola production-related topics, see the Canola Encyclopedia. For a quick and portable reference, download the publications "Canola Disease Scouting Guide" and "Canola Insect Scouting Guide" at **canolacouncil.org** and sign up for Canola Watch at **canolawatch.org** to get our in-season tips and updates on in-crop insect and disease observations.

5. **Assess the true value of new products.** For any new product, we encourage farmers to ask for replicated trial results from Western Canada and do their own on-farm testing. Protocols for on-farm trials are provided at **ultimatecanolachallenge.ca**.

Consider your customers: Keep It Clean

Every farmer has a role in protecting Canada's valuable reputation as a leader in providing export-quality grain to customers around the world. This reputation relies on all farmers following best practices with pesticides to avoid unacceptable residues. For Keep It Clean tips and reminders for canola, cereals and pulses, go to **keepingitclean.ca**.

ANGELA BRACKENREED
TERRITORY: EASTERN MANITOBA
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CCC agronomy team lead for: Harvest, storage and economics

The new Combine Optimization Tool (to be launched in March) at **canolacalculator.ca** will help farmers understand the complexities of setting the combine to balance reduced losses and harvest efficiency. For the past few years, I have emphasized the importance of using drop pans to check for combine losses and then adjusting the combine as necessary to bring losses down to an acceptable level. Whether that's 0.5 bu./ac. or 2 bu./ac. or whatever, will depend on the farmer and the harvest situation, but the new tool helps clarify how some of those adjustments actually make a difference.

JUSTINE CORNELSEN
TERRITORY: WESTERN MANITOBA

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CCC agronomy team lead for: Blackleg

My priority for blackleg management is to help build a stronger understanding of how resistance within canola varieties works. Genetic resistance to blackleg can involve several mechanisms that work in different ways to protect the plant. Another key component will be around identifying the blackleg races within a field to help determine a suitable form of resistance to be deployed. A new labelling system and diagnostic test may be complex but, once understood, these tools will help producers make better-informed crop decisions around managing blackleg on their farms.

SHAWN SENKO
TERRITORY: NORTHEAST SASKATCHEWAN

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CCC agronomy team lead for: Precision farming and machinery

I believe precision farming – as it refers to varying inputs to get the most profit out of each unit of land – will eventually become a common and accepted practice, especially on variable land. I compare it to no-till or minimum tillage, which became commonplace as farmers realized the stewardship and economic benefits. While it may be a few years before precision techniques make sense for all farms, I would encourage all farms to start evaluating the practice and keep records on fertilizer rates, soil variability and other factors that could help with a precision variable-rate system. Precision farming is more than just fertilizer. Canopy density maps can be used for variable-rate fungicide applications and technology is coming along for nozzle-by-nozzle control and on-boom weed sensors that could bring the benefits of instant on-off and possibly variable-rate herbicide applications.

WARREN WARD
TERRITORY: SOUTHEAST SASKATCHEWAN

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CCC agronomy team lead for: Fertility

Clubroot is my top priority, given that it seemed to take a firm hold in Saskatchewan in 2017. I would like farmers and agronomists in my region to start adopting the use of clubroot-resistant varieties before they discover clubroot, and recognize that their region and their crops are not immune to this disease. As for fertilizer management, I will keep encouraging farms to match phosphorus applications with removal rates.

For more Canola Digest content on Precision Farming, read "Why are low-yielding areas low yielding" and "Soil sampling in the big data era" at **canoladigest.ca**.

NICOLE PHILP
TERRITORY: SOUTHWEST SASKATCHEWAN

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CCC agronomy team lead for: Ultimate Canola Challenge, Canola Performance Trials, genetics and seed

For 2018, I encourage farmers to think how they can make seed decisions that more specifically match the variety to the situation in each field. What variety traits and characteristics will help you manage acres in the most efficient way? Consider disease resistance, harvest management, days to maturity, lodging and other factors in addition to just yield potential. Use the tool at **canolaperformancetrials.ca** to compare leading varieties. Breeding new varieties continues to provide solutions for farmers, but genetics need to be managed with good agronomics to ensure traits are available for the long term.

Get timely insect and disease updates and tips

Is that insect a problem in my area? What are the risk factors for sclerotinia? How do I know whether to spray? What does clubroot look like?

Sign up for Canola Watch to get timely updates on insects, diseases and much more. Canola Watch provides observations and agronomy tips based on weekly conversations with the CCC agronomy team, provincial extension staff and many other experts. To sign up for the email, go to **canolawatch.org/signup**.

IAN EPP
TERRITORY: NORTHWEST SASKATCHEWAN

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CCC agronomy team lead for: Weeds

Clubroot scouting and management will be a priority for my territory in 2018, given the confirmation of clubroot in Saskatchewan Districts 9A and 9B in 2017. I expect more confirmations in 2018 and will spend a lot of time in regional meetings sharing the clubroot mitigation steps shared in Dan Orchard's priorities on pg. 22. If I put on my weeds-management hat, there is a strong tie-in to clubroot management. Control of canola volunteers and early control of all weeds is always a good economic message, but this early control also stops volunteer canola and other clubroot-host weeds from forming galls and building up clubroot spore loads in non-canola years. Common weeds such as wild mustard, stinkweed, flixweed and shepherd's purse can all host clubroot. These weeds, if not controlled, can negate some of the benefit of crop rotation, a highly valuable clubroot management tool.

BRITTANY HENNIG AND AUTUMN BARNES*
TERRITORY: ALBERTA SOUTH

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CCC agronomy team lead for: Scouting and tillage

How to mitigate the risk of clubroot will be the priority in Southern Alberta for 2018. Although clubroot was found south of Highway 1 in 2008, we thankfully have not seen the intense spread that Central Alberta has – yet. With higher clubroot spore loads creeping in from the north, we need to ensure we continue best management practices. Proper scouting for the disease needs serious attention – which includes critical judgment calls as to whether you require a resistant variety or not. Analyzing tillage requirements per field to decrease soil movement will be a crucial part of risk mitigation. Not only do we need to look at the soil moved on equipment, but also at erosion due to the wind. Clubroot spores move wherever soil moves.

**Pictured: Autumn Barnes returns from parental leave.*

KEITH GABERT
TERRITORY: CENTRAL ALBERTA SOUTH

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CCC agronomy team lead for: Insect pests and sclerotinia

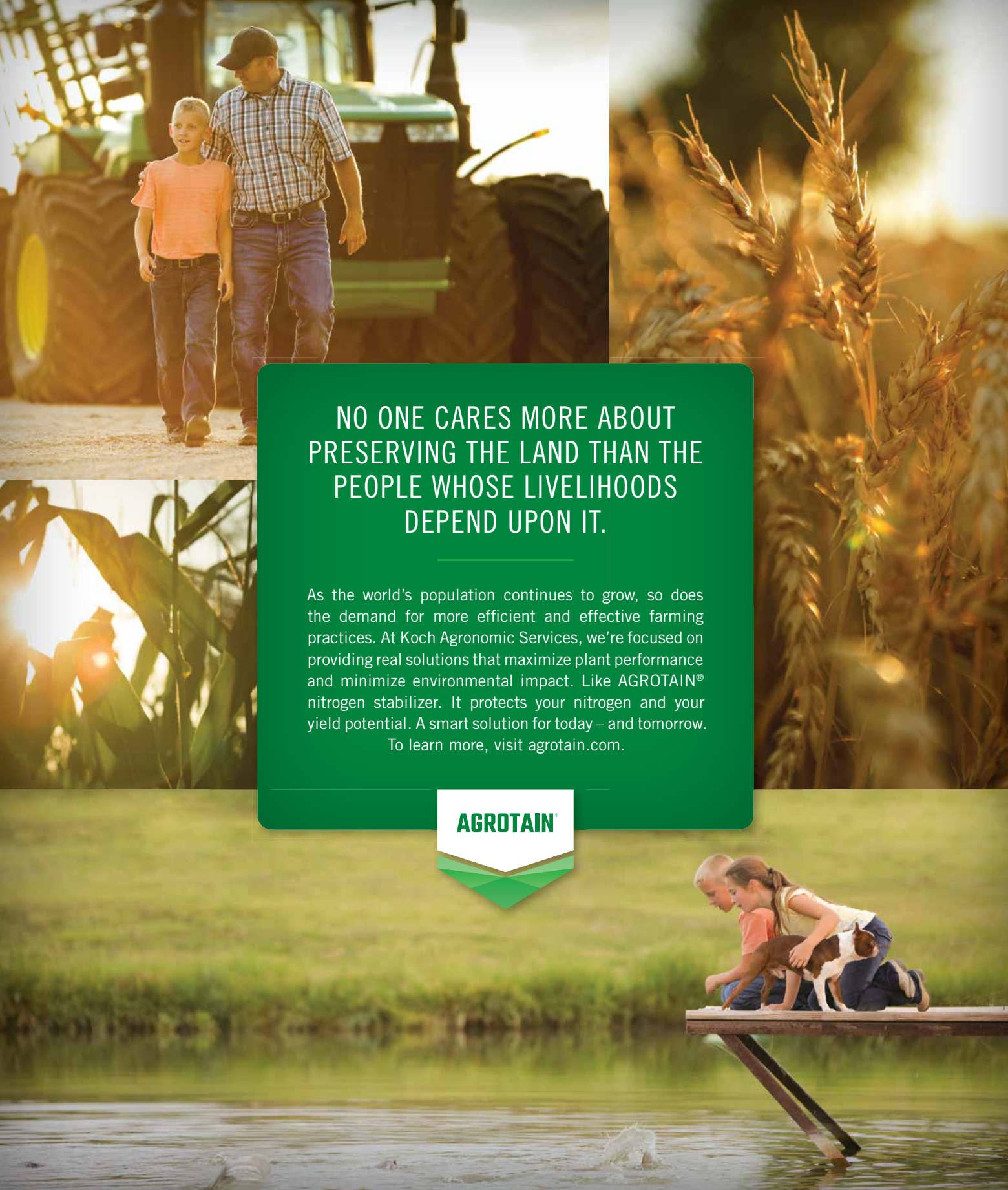
My priority for 2018 remains focused on maximizing basic agronomic planning. A solid plan, good agronomy-based decision making and favourable weather has consistently rewarded our growers with impressive canola yields. Clearly understanding which disease, insect and other challenges are affecting your canola crop allows you to fine-tune your crop management appropriately. Scouting remains the only way to get this done. Your shadow is likely the best investment possible to put into your crop. One pest we watch for in Central Alberta South is cabbage seedpod weevil, and scouting is now simplified with some new Ag Canada research. The economic threshold has been set at 25 to 40 weevils in 10 sweeps. Four sets of 10 sweeps (down from 10 sets of 10) is sufficient to estimate CSPW populations, as long as these rules are followed: sweeps are a full 180-degrees each; divide the four sets into two pairs; each pair has to be done in distinctly different parts of the field; and within each pair, each sweep has to be separated by 50 metres or more.

Improving sclerotinia management in wet conditions remains a challenge, year over year, but particularly for those 2018 canola fields planted on 2016 sclerotinia-infested canola. These fields may see an increase in disease risk this year with moisture. Make sure you attend a few summer learning opportunities, sign up for Canola Watch and check out **fieldheroes.ca** to understand what other "good" bugs are working on your behalf.

Videos for visual learners

Would you rather learn through videos? The Canola Council of Canada has a library of high-quality canola videos, including: Blackleg Disease and Resistance Management, Clubroot of Canola: Disease Cycle, Swede Midge and Canola, Canola Stand Establishment: A Grower Q&A and Harvest Management & Mitigated Loss: A Grower Q&A. To watch these and other titles, go to **canolacouncil.org** and click "Video Gallery" under the Resources tab at the top.

Credit: iStock.com/Blackzheep



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The Ultimate Canola Challenge (UCC) is a program to challenge growers to make better decisions for higher profitability, not just higher yields. It provides protocols for on-farm trials, and it coordinates on-farm trials for specific research objectives.

The UCC research objective for 2016 and 2017 was to compare base nitrogen rates with a rate 25 per cent higher. Over the two years, 15 UCC-coordinated on-farm trials were harvested and met UCC protocol standards. When averaged across all 15 sites, adding 25 per cent more nitrogen did provide a statistically significant yield response, but the increased nitrogen did not always provide an economic return when compared to the base rate.

For more on UCC including protocols for on-farm trials and objectives for 2018, go to **ultimatecanolachallenge.ca**. To participate in 2018, email Nicole Philp at philpn@canolacouncil.org.

DAN ORCHARD
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CCC agronomy team lead for: Clubroot

Given the confirmation of clubroot in the Peace Region and Northwest Saskatchewan in 2017 and with continued expansion of clubroot in my territory, encouraging farmers to scout for and take steps to prevent or manage clubroot stays at the top of my priority list. Steps include rotation out of canola for at least two years, using clubroot-resistant varieties, controlling host weeds and volunteer canola in non-canola years, and keeping soil movement to a minimum – as clubroot spreads when soil moves. Equipment sanitation, reduced tillage and taking care to limit all traffic on fields fall under "minimize soil movement". I encourage all farmers to become familiar with clubroot. Read Canola Watch. Go to canolaPALOOZA and other tours. Watch the CCC video "Clubroot of canola: Disease cycle". Go to **clubroot.ca** to find this video and lots more on scouting, prevention and management.

GREGORY SEKULIC
TERRITORY: PEACE REGION OF ALBERTA AND B.C.

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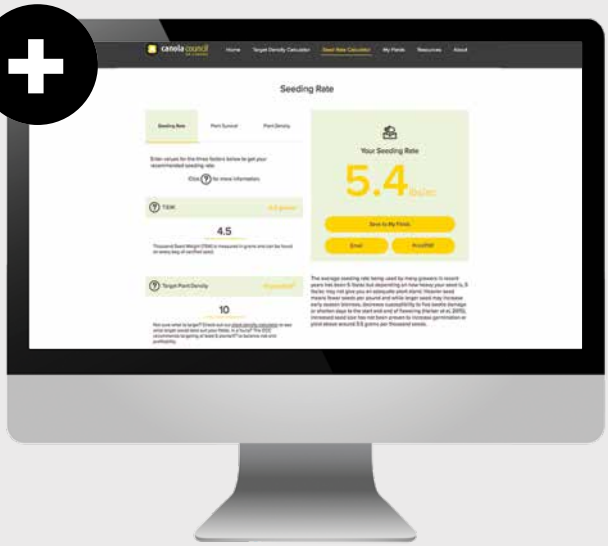
CCC agronomy team lead for: Sustainability, pollinators and beneficials

My priority message for 2018 is to consider the role that beneficial insects play in cropping success and profitability. After being part of the integrated pest management (IPM) and beneficial insect stations at the canolaPALOOZAs in 2017, I have new ideas about the current best practices on minimizing pesticide use while increasing profitability. These ideas incorporate practices that maximize populations of beneficial insects. Examples include using economic thresholds and forecasting checklists for insecticides and fungicides, maintaining buffer strips for pesticide applications, and maintaining natural spaces for these beneficial insects to live. I encourage all farmers to learn more about beneficials in 2018. Attend a canolaPALOOZA event, sign up for Canola Watch and check out **fieldheroes.ca**.



Use our tools to set target stands and seeding rates

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Target density calculator. Users position sliding scales to determine the level of risk for various factors that influence plant-stand targets. If weed competition is very low, for example, the calculator will set a lower target stand. But if spring frost risk is high, the calculator sets a higher target stand to compensate.

Seeding rate calculator. This tool has three modes. In seeding rate mode, users input thousand seed weight, target plant density and estimated seed survival, and the calculator computes the required seeding rate. In plant survival mode, users enter the number of plants per square foot that emerged along with known seed weight and seeding rate, and the calculator gives the seed survival rate. In plant density mode, the calculator takes thousand seed weight, seeding rate and estimated seed survival to give the number of plants that should emerge.

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Clubroot management

Keep clubroot spore counts down and you can avoid major yield loss from the disease. In this article, CCC agronomy specialist **Dan Orchard** describes five proven steps that can prevent clubroot from taking hold in a field or, if it does take hold, from rising to yield-damaging levels.

Technically it only takes one spore to cause clubroot infection, but the chance of a root coming in contact with one spore is almost impossible. In greenhouse research, pots with 10,000 spores per gram of soil can consistently cause infection. Under field conditions, it may require 10 times that many – or about 100,000 spores per gram of soil. Surveys in central Alberta have found patches with 10,000,000 or more spores per gram. We know that some fields in Manitoba have areas with more than 100,000 per gram. And with clubroot symptoms confirmed in Saskatchewan Districts 9A and 9B in 2017, some canola fields in those districts (and likely others) will exceed 100,000.

Early detection of clubroot through field observation of galls or soil sampling is a good step in preventing spore build up. These five actions used in combination also work well to keep the disease down.

STEP 1. ROTATE CROPS

In clubroot areas, a two-year break is the minimum recommendation and a three-year break – or longer – may be required to reduce spore numbers to a manageable number.

STEP 2. LIMIT SOIL MOVEMENT

Moving soil means moving clubroot. Keep machinery clean as it moves field to field, clean used machinery before bringing it to the farm, check custom machinery before it comes on the farm, use reduced tillage to limit spread of clubroot patches in a field and to reduce wind and water erosion of soil particles. Soil particles less than 0.1 mm size can carry for many kilometres on the wind, and clubroot spores are much smaller than that.

STEP 3. CONTROL CANOLA VOLUNTEERS AND OTHER HOST WEEDS

Common weed species that can form clubroot galls and cause unexpected spore build up are wild mustard (*Brassica kaber*), stinkweed (*Thlaspi arvense*), flixweed (*Descurainia sophia*) and shepherd's purse (*Capsella bursa-pastoris*). Spore-producing galls can form within three weeks of weed germination. If left to grow, these weeds and volunteers – even if fairly low in number – can produce enough spores to negate any benefit to crop rotation.

STEP 4. GROW A CLUBROOT-RESISTANT (CR) VARIETY

Grow CR canola as soon as clubroot is found in the county, municipality or district and, to reduce the risk further, start before the arrival in your jurisdiction. A susceptible variety grown with clubroot present will allow for the increase of spores to uncontrollable levels within one crop. A resistant variety will often not be completely free of clubroot, but the impact and contribution to the spore load is far less. Also, the chances of selecting for pathotypes that overcome the resistance gene is much more likely when spore loads get high.

Steven Strelkov, clubroot researcher at the University of Alberta, has identified 17 clubroot pathotypes in Alberta, and many of them are virulent on all current CR genetic sources. We need to keep those pathotypes down.

STEP 5. CONSIDER PATCH MANAGEMENT PRACTICES

If clubroot patches are identified, you can seed these patches to a long-term cover crop that prevents soil movement and basically quarantines that patch. If you cut the crop for hay, there could still be clubroot spores in the dust attached to the crop during harvest, so feeding the hay in areas where canola won't be cropped is desirable. Control host weeds in the patch (which should be easy in a grass crop). Consider equipment sanitation at all times when working in those patches.

Liming is another practice that works in clubroot soils around the world. Lime increases soil pH, which will reduce the severity of clubroot. (It will not eliminate the clubroot risk entirely and significant clubroot can occur even at high pH levels.) We are still working on best practices for Western Canada. Check Canola Watch for updates.

— Dan Orchard is the Canola Council of Canada agronomy specialist for Central Alberta North. Email him at orchardd@canolacouncil.org.

For more on clubroot prevention, scouting and management, go to **clubroot.ca**.

Sometimes working with other oilseed-producing and -exporting nations is necessary to solve bigger industry issues. CCGA is involved in two international organizations to benefit Canadian canola farmers.

CO-OPERATION WITH COMPETITORS

BY TREENA HEIN

Canadian Canola Growers Association (CCGA) participates in two international organizations to share ideas and work together on common interests. They are the International Oilseed Producers Dialogue (IOPD) and International Agri-Food Network (IAFN).

INTERNATIONAL OILSEED PRODUCERS DIALOGUE

IOPD is a loosely knit group of national oilseed farmer associations who meet annually, working together to discuss common issues and develop strategies that will allow oilseed farming to remain sustainable. The group includes organizations from many of the largest oilseed-producing countries, representing commodities such as canola, canola-quality rapeseed and soybean. Recent hosts of the Dialogue include Australia, United States, Paraguay, Canada and England.

"While we are competitors, we have learned that by understanding our shared challenges and issues, we can develop common strategies that we can each use in our own countries and in any international work that we do to ensure our future is as bright as possible," explains CCGA president and canola farmer Jack Froese. "It's critically important that we continually communicate with each other about what we are doing right, how we can improve, and what we're up against in terms of public trust issues, transportation costs and so much more."

Catherine Scovil (front row, second from the left) and Jack Froese (fifth from the right) represented CCGA at IOPD in Australia. The other people are from oilseed producer associations from around the world.

This "so much more" includes how to best to ensure access for farmers to new innovations and technologies, says CCGA CEO Rick White, and how to promote regulatory systems that are science-based and do not impede trade. Globally harmonized maximum residue limits (MRLs) is one goal.

"The Dialogue gives CCGA the chance to make sure Canadian canola growers are updated about common global concerns and opportunities," Froese says. "We have to be aware of everything that's happening. Some of the current opportunities discussed are new seed technologies and niche markets. Challenges include food security and how so many aspects of production relate to sustainability. Another example of a challenge is the extreme views that our European counterparts face related to the use of advanced plant breeding techniques and many crop protection products as well. What happens in Europe sends ripples throughout the world and we must stay informed."

For more, go to **ccga.ca** and search "IOPD" to find resolutions from the latest meeting in Sydney, Australia.

INTERNATIONAL AGRI-FOOD NETWORK

The IAFN works to ensure that the agri-food sector, including farmers, is engaged in global discussions addressing global poverty and food security. Agriculture is instrumental to development, and modern technology is an integral part of the solution to poverty and food security in developing countries, notes Janelle Whitley, CCGA policy development manager.

The Network consists of 14 international associations, representing international companies, national groups, co-operatives and millions of farmers. It meets once a year for an annual meeting and the yearly gathering of the UN Committee on World Food Security. It also holds other smaller meetings.

"Many views exist on how agriculture should evolve and what form of agriculture best meets global challenges to food security and of climate change," says Whitley. "How programs and policies are developed internationally can impact global trade and farmer access to new technologies, such as biotech seed varieties and crop inputs. It's critical that modern agriculture be recognized as an integral pillar of food security, and the goal of CCGA's IAFN involvement is to ensure individuals who influence global multi-lateral policies – such as the UN Sustainable Development Goals and Codex reforms – fully understand the benefits provided by modern farming technologies."

Whitley explains that these benefits aren't always understood or recognized by decision makers. "Through IAFN, CCGA works to demonstrate the importance of innovation to canola and agriculture, more generally," she says. "It has allowed Canadian canola farmers to increase yields in a social, financial and environmentally sustainable way. Globally, a conducive operating environment is critical for farmers here and around the world to ensure they can grow crops using a full suite of tools – and have confidence their crops will be welcome in international markets."

For more, go to **agrifood.net**.

— Treena Hein is an award-winning science writer and educational resource consultant.

Once spore-infected flowers fall onto a canola leaf or stem, infection proceeds very quickly, with lesions visible in as little as a day. This was one of many discoveries shared at Canola Discovery Forum in December.

SCLEROTINIA INFECTION MOVES FASTER THAN WE THOUGHT

BY JAY WHETTER

Canola Discovery Forum 2017 was part of Canola Week, which attracted 375 attendees in Saskatoon in December. Discovery Forum featured sessions on sclerotinia stem rot, clubroot, blackleg fertilizer and a panel on "adapting to change". Here are a few notable discoveries.

SCLEROTINIA STEM ROT TIMELINE FOR INFECTION

Dwayne Hegedus, research scientist at Agriculture and Agri-Food Canada (AAFC) Saskatoon, presented on the sclerotinia stem rot infection cycle. It begins when sclerotia in the soil (left from the last time an infected crop was produced on that field) take up enough moisture to germinate and form little mushrooms known as apothecia. Spores are then released into the air from the mushrooms. Under ideal warm and moist conditions, it takes about two to three weeks for sclerotia to germinate and release spores.

Once spores are released, some land on flower petals and some of those petals fall on stems and leaves. Spores then germinate and the fungus grows on the dead petals for a short time before coming into direct contact with the plant. At this point, the infection proceeds very quickly with lesions being visible in as little as 24 hours.

Hegedus describes the steps:

1. The waxy outer surface of the plant, the cuticle, is penetrated within hours. "This is much quicker than we thought it would be," Hegedus says. In as little as one hour of the fungus being placed on a healthy plant, genes for the enzymes that break down the cuticle and for toxins that kill the plant were already being expressed, he says.

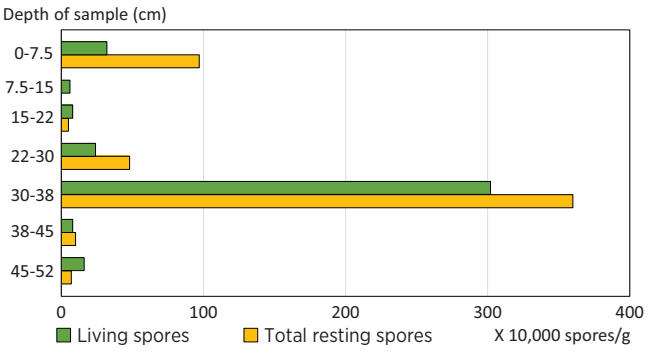
2. Once the cuticle has been penetrated, the fungus grows within the plant tissue in a kind of stealth mode for a short, but critical, period that lasts six to 12 hours. "In this 'biotrophic phase', the pathogen is essentially hiding from the plant, allowing it to quickly build up biomass before radiating through plant tissues," Hegedus says. This is an important stage for research, he says, because if they could target that phase with an improved genetic response from the plant, they could stop the spread that allows the disease to take hold.

3. The fungus then rapidly colonizes the plant as hyphae begin to spread throughout the plant over the next 12 to 24 hours. Generous amounts of acid, digestive enzymes and toxins are being produced by the fungus during this phase.

4. After just one day, the first visual symptoms of plant tissue death (necrosis) appear.

While researchers will continue to work to extend this knowledge and improve plant defences from a genetic perspective, Hegedus says this information can assist farmers to make better decisions if they wish to "move away from prophylactic fungicide applications."

He says the study stresses the importance of surveillance of fields for sclerotia and apothecia and the development of forecasting tools, since little can be done to save the plant once it has become infected. Fungicide applications now are based on pre-emptive prophylactic protection based on an assessment of the likelihood of infection. If farmers could instead scout for the first appearance of apothecia, they would know that spores will be present and infection will likely occur within a day or two if the crop is dropping petals and the canopy has the humid conditions necessary for infection.



Close examination of this field in Alberta, which has had clubroot for at least 10 years, showed a concentration of spores deeper in the soil profile and a large percentage of "dead" DNA at the soil surface.

CLUBROOT SPORES: LIVING OR DEAD?

The overall message from Mary Ruth McDonald, researcher and prof at the University of Guelph, is to keep clubroot spore counts low. This will limit economic damage from the disease. (For more on spore management tips, read Dan Orchard's "5 steps to better..." article in this issue.)

Two messages from McDonald on clubroot spores:

Soil tests for the presence of clubroot DNA identify living and dead spores. An alternative test, which uses propidium monoazide (PMA), can separate the living from the dead. PMA binds to DNA and prevents amplification, but PMA cannot pass through the cell membrane of living cells. "At this time, commercial labs have not set up to use the PMA-PCR method, but we are talking to some of the provincial labs about implementing this approach. The method has been published in the scientific literature, so any lab could add it to their offerings," McDonald says.

Clubroot spores can settle down in the soil profile at fairly high levels. McDonald shows clubroot spores at various depths for one

field studied in Alberta. In that field, which had clubroot for at least 10 years, most of the spores were down at a depth of 30 to 38cm. Resting spores do move down in soil, probably washed down with water, she says, and in this field were probably held up by a compaction layer or hardpan around that 30 to 38cm depth. Instead of thinking that the spores live longer at depth, we think it is related to time. "It appears that 'fresh' or 'young' spores either have a large number that are immature and can't germinate or that a relatively high proportion die off quickly, perhaps due to more extreme temperature and moisture variation at the soil surface," she says. "The resting spores deeper in the soil will be older and the ones that survive for the first few years after they are produced seem to then go on to live for a long time."

We might assume that deeper spores are not much of a yield threat to canola, but McDonald emphasizes that we don't know for sure. "Very few researchers have looked at the distribution of resting spores in the soil profile, and no one has looked at how resting spores at depth actually affect canola growth."

BLACKLEG: MORE COMPLEX THAN ORIGINALLY THOUGHT

Researchers are discovering how interactions between blackleg races in the field and varieties is more complex than originally thought. "While researchers work through the management implications for this complexity, for farmers, this shows the importance of an integrated management approach for the disease," says Justine Cornelsen, agronomy specialist for the Canola Council of Canada. "The identification of major resistance genes within varieties will provide producers with another option, but it needs to be stewarded carefully with other best management practices for the disease."

Dilantha Fernando at the University of Manitoba has been working on identifying the genes found across the canola growing regions of Canada to better understand gene interactions and how to properly rotate resistant varieties. Hossein Borhan, AAFC Saskatoon, has been identifying the complex gene interactions while working on developing new sources of resistance and developing an isolate set to screen for blackleg races within the field.

"This work will help identify new sources of resistance to be deployed across Canada," Cornelsen says. "And understanding the fungus at the field level will help steward the new major-resistance gene label program that will help producers make informed variety decisions."

FERTILIZER: NITROGEN 'INTENSITY OPTIMUM'

Reynald Lemke, research scientist with AAFC in Saskatoon, talked about managing nitrogen fertilizer in a carbon-concerned world. Nitrous oxide, the gassed-off loss from nitrogen applications, is a greenhouse gas and is one kilogram of nitrous oxide is the GHG equivalent of around 300 kg of CO_2. These losses are also a waste of input dollars. Lemke went over the agronomic optimum, economic optimum and introduced a new idea called the "intensity optimum."

Agronomic optimum is the rate of N fertilizer that produces the maximum grain yield.

Economic optimum is acceptable return on investment for the last pound of N applied. This will vary by crop and input prices and the grower's own acceptable ratio for return on investment for the last pound of N applied. Some farmers are OK with a 1:1 ratio of return: cost for the last pound. Others want a higher ratio of return. Either way, the economic optimum will represent a lower N rate than the agronomic optimum.

Intensity optimum factors in the potential environmental cost (through N losses to the atmosphere or environment) of choosing a fertilizer N rate. For every increment of fertilizer N applied there is a risk of a negative environmental consequence (environmental cost).

"Because we're not going to stop producing food, and we need fertilizer N to produce that food, then the appropriate response to this issue is to think in terms of intensity," Lemke says. "Yields tend to increase strongly to the first increments of N applied and then increases begin to diminish at higher N rates, while environmental costs tend to increase slowly over the first increments of N and then increase strongly at the higher N rates."

"This is not yet well established, but fertilizer N rate providing 'optimum intensity' is almost certainly going to be lower than the optimal agronomic rate, and probably close to but perhaps also a bit lower than the optimal economic rate," he says.

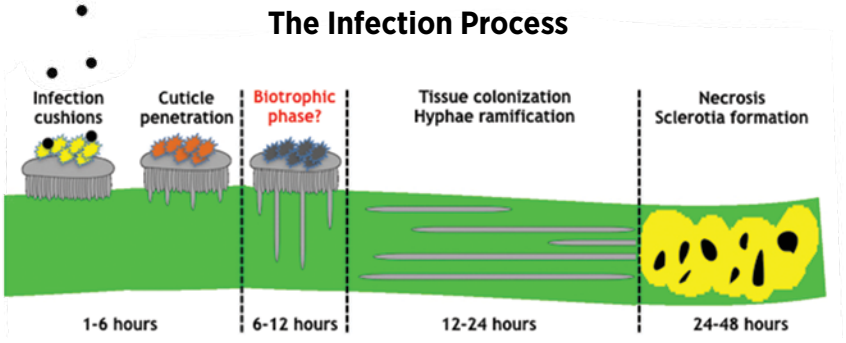
YIELD AND ECONOMICS OF VARIOUS ROTATIONS

Breanne Tidemann, research scientist with AAFC in Lacombe, presented during the "adapting to change" panel on a nine-year rotation study that compared continuous Liberty Link canola, continuous Roundup Ready canola, canola in a two-year rotation with wheat and canola in a three-year rotation with peas and barley. Trials were repeated at five locations across the Prairies and "all phases" were repeated each year. For example, for the canola-barley-peas rotation, every phase of the rotation – canola, peas and barley – were grown each year to eliminate the confounding effect of different environmental conditions each year.

When all sites and years are averaged, canola yield improved 5 bu./ac. with a one-year break and another 5 bu./ac. with a two-year break. While this is an average, Tidemann notes that results were quite different year to year and site to site. In Melfort, Sask., for example, there was no yield difference between rotations in 2012, but in 2016, canola yields were 17 bu./ac. higher with a one-year break and 34 bu./ac. higher with a two-year break.

When adding economic analysis to this study, net returns for each site each year were highly variable. "But when averaged across all sites and years, net returns were similar for all rotations," Tidemann says.

A concluding document for the study had this statement: "These data refute the



Dwayne Hegedus produced this image to show the steps and timeline from spores on petals to infection of plant tissue.

notion of continuous canola being the most profitable rotation. Furthermore, these data do not account for increased disease, insect pest and weed threats [from continuous canola] that are likely to threaten sustainable canola cropping over the long term."

CANOLA HELPS THE ATMOSPHERE

Brian McConkey, research scientist at AAFC Swift Current, presented during the "adapting to change" panel. He says Canadian soil organic carbon has been going up since 1971, which is a good thing for reducing carbon in the atmosphere, and canola leads the way. Seventy per cent of the increase in soil organic carbon in Canada since 2005 is due to canola alone, McConkey says. How? For one thing, canola has displaced almost all the summerfallow acres in that time, and summerfallow tends to release carbon, not store it. Another benefit is that canola will increase soil organic carbon more than cereals will. A big part of that is from the part of the plant we don't see: the root. Canola root mass is huge compared to a cereal root, and that big root is effective for soil carbon sequestration. (See Leon Kochian's root photo.)

Leon Kochian, associate director and research chair with the Global Institute for Food Security in Saskatoon, grew these canola roots hydroponically. He doesn't think any crop plant could do this in the field, but it gives you an idea of the potential root biomass of a canola plant. This is how canola can sequester large amounts of carbon.

Another positive factor: Canola crops are much more reflective than cereals. Yellow flowers reflect sunlight energy back out into space, and they do this during the hottest months of the year. This has a large cooling effect, McConkey says. Leaving stubble to catch snow also reflects more solar energy back into space, enhancing the global cooling effect.

— Jay Whetter is the editor of Canola Digest.

Curtis Rempel's top 10 highlights (and one bonus)

Curtis Rempel, vice president of crop protection and innovation for the Canola Council of Canada, provides this top 10 list of key points from Canola Discovery Forum.

1. Producers need to be thinking about sustainability when it comes to fertilizer management, but maximizing nitrogen use efficiency also likely limits nitrous oxide losses to the atmosphere, so that's a win-win. One tool that seems to help are urease nitrification inhibitors, which reduce losses and therefore effectively reduce emissions.

2. Clubroot may benefit from a variety system that can match plant resistance to pathotypes in the field, similar to what we have for blackleg. Research has identified up to 17 clubroot pathotypes in Western Canada, and some are more aggressive than others.

3. Clubroot pathotypes 3 and 5 are predominant in new clubroot fields found in Saskatchewan and Peace. That means traditional clubroot resistance is still effective in these fields, but this resistance will erode quickly if spore numbers are allowed to increase.

4. Managing clubroot is all about keeping spore numbers down. A two- or three-year break between canola crops is imperative. Other management measures, including fumigation and liming, may prove to be economic options to enhance clubroot spore management, but more work is required to refine agronomy recommendations.

5. Stem tests for assessing sclerotinia stem rot resistance or tolerance genes are working in some instances, but not all. This points to variability in the pathogen. Some isolates are more aggressive, and two are found to be very aggressive. It seems not all sclerotinia is the same.

6. Sclerotinia management would benefit from a better predictive model using field weather stations, spore sensors and other tools to predict the presence of the disease, conditions for infection and the timely and likely return on investment for a fungicide spray. We don't have this, yet.

7. A blackleg resistance gene can become effective again if not used for a number of years. In that time, the blackleg population in the field will change again, often shifting back to an Avirulent form that the gene can stop.

8. It takes years of study to develop an integrated management program (IPM) for an insect. It took University of Guelph researcher Rebecca Hallett 17 years to build an IPM program for swede midge. Taxonomy, biology, ecology, growth models, action thresholds and damage are all important in design of management tactics. Swede midge has been a nightmare for canola growers in Ontario and, while midge has not been a major problem in canola in Western Canada yet, it can establish itself in all canola growing regions of Canada.

9. Vern Baron, AAFC Lacombe research scientist, has found that planting canola early and targeting higher yields can make it a very sustainable crop. These steps also tend to increase profitability.

10. Soil surveys are great resources for making management decisions, and University of Saskatchewan soil scientists Angela Bedard-Haughn is putting Saskatchewan soil data online in a more user-friendly and accessible database called Saskatchewan Soil Information System. Similar tools also exist in Manitoba and Alberta.

11. Canola produces 50 per cent more residue than wheat, largely due to its root system. This is how canola will increase soil organic carbon, improving carbon sequestration. Canola is also the most reflective Prairie crop, reflecting more hot summer sun back into space.

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Research assistance

Finding co-operators to help with trials is a necessary part of the Ultimate Canola Challenge and Canola Production Trials programs. These four farmers helped with the two programs in 2017, and explain why they did it, the work involved and what they learned from the experience.

BY JAY WHETTER

JOHN GUELLY
WESTLOCK, ALTA.

John Guelly had Bayer Demonstration Strip Trials (DSTs) on his farm in 2017 and 2016. The Bayer trials are also included in the Canola Performance Trials field-scale program. All hybrids in Guelly's plots are clubroot resistant. In 2017, his trials had three Bayer hybrids, one Dekalb and one Canterra. In 2016, the mix was two Bayer, one Canterra and one Pioneer Hi-Bred.

Guelly seeded, swathed and combined the trial fields, and was on hand for plant counts and disease assessment.

"By doing these trials, I get to see the difference between new Bayer varieties and their close competitors. I get to compare them for maturity, harvestability and yield," Guelly says. "By doing it on my own dirt, it helps me make better seed decisions for my farm."

"I would like to do these trials every year," he adds.

In the end, results from his plots were excluded from the official CPT results for 2017 because of hail, but bushels per acre were still in the high 60s.

Being in a high-clubroot area, Guelly is compelled to grow clubroot-resistant (CR) varieties. With good results – even with a little hail – he can use these results to encourage growers in newer clubroot areas to switch to CR varieties. "I can show those who are not growing CR varieties that there's no yield drag for them."

Guelly is on the Alberta Canola board and, as research chair for the organization, is also part of the CPT Governance Committee. "As growers, we have more leverage with the seed companies than organization staff might have. With that leverage, we can help the CPTs get varieties that farmers want," he says. "Canola farmer organizations are now paying for the whole cost of the CPT programs, and without having the most current varieties that farmers want, CPTs would be far less valuable."

If looking at the InVigor DST Map online, find John Guelly's results at Pickardville, just north of Edmonton.

> "By doing these trials, I get to see the difference between new Bayer varieties and their close competitors... By doing it on my own dirt, it helps me make better seed decisions for my farm."
>
> —John Guelly

Go to **canolaperformancetrials.ca** for 2017 results and use the database to compare results from 2011 to 2016 as well.

GERRY HERTZ
EDENWOLD, SASK.

Gerry Hertz ran an Ultimate Canola Challenge (UCC) nitrogen trial in 2017. Nicole Philp, the Canola Council of Canada agronomy specialist who runs the UCC program, asked if he'd be interested in doing a trial, and he agreed.

"I'm an agronomist and the interest – the seed – for running trials had always been there for me," Hertz says. "I just needed someone like Nicole to water that seed."

The objective of the UCC trials in 2017 was to run replicated strips comparing the farmer's usual N rate to a rate 25-per-cent higher. Hertz ran two trials. His base N rate was 120 lb./ac. For his first trial, he did the 25 per cent increase, seeding four replicated strips with 150 lb./ac of N. Then he did another trial with the test strips being 180 lb./ac. – a 50 per cent increase.

It ended up being a dry year in the area, so Hertz's check strips using the base 120 lb./ac. fertilizer rate was his most economic rate.

"At 180 lb./ac., we saw a slight improvement in yield, but I'm not going to spend a dollar on fertilizer to see a dollar gain in yield," he says. "Once my return on investment gets to around $4 in yield for each $1 of fertilizer, I start to think of other inputs that might provide a better return."

Hertz would have more confidence is his results if he could repeat the trials in a year with better moisture. "The check rate was the right rate for 2017, but in a better year that 120 lb./ac. of N might not be maxing out the economic potential for canola on my farm."

He would also consider a different trial location. The field had a slough near the headlands, which he thinks probably affected results for at least one strip, and he had

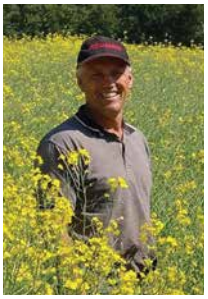
"At 180 lb./ac., we saw a slight improvement in yield, but I'm not going to spend a dollar on fertilizer to see a dollar gain in yield."

—Gerry Hertz

a little hill in the middle of the trial. "I have autosteer for the seeder and sprayer, but not on the swather," he says, so he couldn't eye-ball the flag at the far end. "I had to get a neighbour to stand on the top of the hill and help me swath straight down the middle of each trial."

For on-farm trials, Hertz recommends a little pre-planning to make sure they get done. A good idea, he says, is to seed the strip-trial fields after all other fields are seeded. "If you intentionally plan it that way, there will be less pressure and you'll do it right – without the stress."

Go to **ultimatecanolachallenge.ca** for more results from the nitrogen trials and results from boron trials from previous years. You can also get protocols for your own on-farm trials. To participate in 2018, email Nicole Philp at philpn@canolacouncil.org.



KEITH FOURNIER
LONE ROCK, SASK.

Keith Fournier had been increasing his fertilizer rates over the past few years and wonders how much farther he can push nitrogen (N) and still get a response. When the opportunity came along to run a proper trial following Ultimate Canola Challenge protocols, he took it.

The UCC program for 2017 compared the farmer's usual N rate to a rate 25 per cent higher. Strips of each treatment ran side by side and were replicated four times in the field.

Fournier had applied anhydrous ammonia across the whole field in the fall at a rate of 100 lb./ac. of N. In the spring, he put another 20 lb./ac. of N in a blend across the field and 50 lb./ac. in his treatment strips. He put in flags to mark each separate strip.

In the end, Fournier had no overall response to the extra nitrogen. Check plots (at the 120 lb./ac. rate) had both the lowest and highest yields across the replicated strips. Average yields across all treatments was 63 bu./ac.

"While the trial did require some time and extra money, it was far less costly that it would have been if I had just applied 150 lb./ac. across all my canola acres – and I wouldn't have learned anything by doing that," Fournier says.

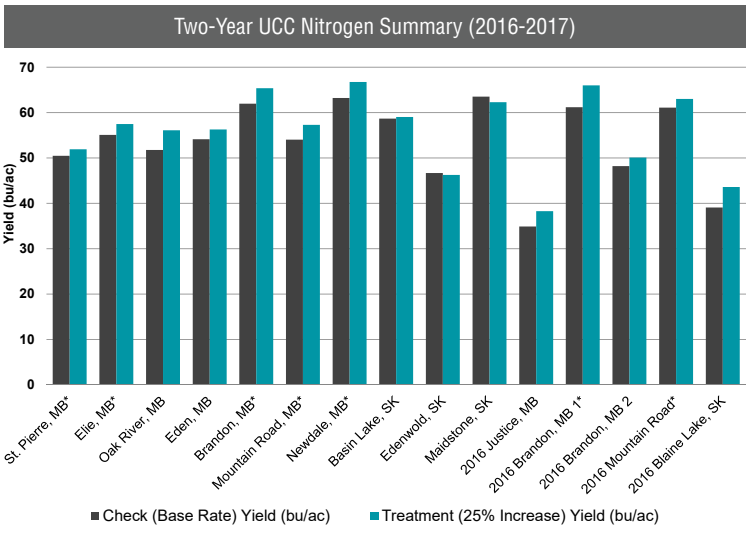
With the good yields he got in 2017, boosting his nitrogen to 150 lb./ac. across the board might have given him the false impression that higher N rates were responsible for his higher yields.

"While the trial did require some time and extra money, it was far less costly than it would have been if I had just applied 150 lb./ac. across all my canola acres – and I wouldn't have learned anything by doing that."

—Keith Fournier

"It was good to learn this on a 10-acre trial instead of on the 900 acres of canola we grow each year."

—Doug Brown



Results from the Ultimate Canola Challenge nitrogen trials for 2016 and 2017. Keith Fournier's result is the Maidstone, SK location, Gerry Hertz is Edenwold, SK and Doug Brown is St. Pierre, MB. For more on these results, UCC on-farm trial tips and more, go to ***ultimatecanolachallenge.ca****.*

"Having done the trials, I now think we must have some yield-limiting factor other than nitrogen," Fournier says. After seeing results from Bourgault field trials in 2017, which compared yield results for various rates of phosphorus (P), he thinks inadequate P might be the factor.

With properly-designed trials, he can test that theory on his own farm.

"I'm gung-ho to try more trials in 2018," he says. He plans to compare strips with his normal P and N rates to strips with higher P and also a third set of strips with a combination of higher P and higher N. He wants to know if increasing P will help canola make use of more available N. "This will require more work, but as farmers, we're always wondering what we can do to get more yield and more return on investment."

DOUG BROWN
ST. PIERRE JOLYS, MAN.

Doug Brown ran an Ultimate Canola Challenge nitrogen trial in 2017, with help from Tone Ag in St. Pierre. "These trials give me a way to gauge if I'm doing it right in my other fields," he says.

In line with UCC objectives for 2017, Brown ran a field-scale canola strip trial, with four strips at his intended nitrogen rate and four at a rate 25 per cent higher.

His intended nitrogen rate was 135 lb./ac., so the high-rate strips were at 165-170 lb./ac.

Brown followed the UCC protocols for on-farm trials. He had strips randomized so they were U-T-U-T-T-U-U-T instead of U-T-U-T-U-T-U-T. "I had some early challenges with emergence due to high soil moisture at seeding and low spring rainfall," Brown says. For spraying, he went at a 90-degree angle to the seeding direction so all plots got the same wheel track disturbance. As per protocol, he also made sure each strip was wider than the swather, and that test swaths were cut through the middle of each strip.

Tone Ag provided a weigh wagon at harvest to get accurate yield measurements for each strip.

"In the end, I didn't see any benefit to the higher rate. Agronomically, I'm already in the optimum range," Brown says, adding that he needed a pretty good canola price "just to break even" on the extra nitrogen at the higher rate.

"It was good to learn this on a 10-acre trial instead of on the 900 acres of canola we grow each year," he says.

— Jay Whetter is the editor of Canola Digest. Want to be in a future panel? Email Jay at whetterj@canolacouncil.org.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The new federal carbon tax starts in 2018 for provinces that don't have their own approved programs. That means every province, in one way or another, will have a carbon pricing program within the year. The good news is that farm fuel is exempt.

CARBON TAX: WHAT CAN YOU EXPECT IN THE YEAR AHEAD?

BY JANELLE HULME

The federal carbon pricing backstop will be implemented in 2018 for any province that doesn't already have its own approved program. The backstop proposes a hybrid carbon pricing policy that will see a carbon tax applied to consumption of fossil-fuel-based energy as well as an emissions cap starting no sooner than January 1, 2019 for facilities emitting more than 50,000 tonnes of carbon dioxide equivalent (CO_2e) per year.

The federal government has stated that any jurisdictions wishing to adopt the backstop should make that request by March 30, 2018. "If a jurisdiction has not notified the federal government of its intention to implement legislation that will meet the federal standard by Sept. 1, 2018, that jurisdiction will have the backstop plan imposed as of Jan. 1, 2019 at the price of $20 per tonne of CO_2e," says Mark Walker, policy development manager with the Canadian Canola Growers Association. Currently, British Columbia, Alberta, Manitoba and Ontario should meet the proposed federal standard as of Sept. 1, 2018.

B.C. has had a carbon tax plan in place since 2008, and Alberta's plan went into action in 2017. Manitoba recently announced the 'Made-in-Manitoba Climate and Green Plan'.

"If a jurisdiction has not notified the federal government of its intention to implement legislation that will meet the federal standard by Sept. 1, 2018, that jurisdiction will have the backstop plan imposed as of Jan. 1, 2019 at the price of $20 per tonne of CO_2e."

—Mark Walker

WHAT IS A CARBON TAX?

A carbon tax is a charge to an individual or business that uses carbon-based energy such as diesel, gasoline and natural gas. The point is to reduce the use of fossil fuels. This tax is applied based on the global warming potential of the carbon-based energy consumed. In practice, this means governments levy carbon taxes per tonne of greenhouse gas (GHG) consumed.

The federal government's carbon pricing backstop plan sets a $10-per-tonne tax for any province has not put their own pricing in place. This tax increases by $10 per tonne every year until it peaks at $50 per tonne in 2022. Many provinces felt this wasn't the best approach, so they made their own tailor-made plans.

ALBERTA

On Jan. 1, 2018, the Alberta government increased its carbon tax from $20 to $30 per tonne. The Alberta carbon tax will increase from 4.49 cents per litre to 6.73 cents per litre for gasoline, from 5.35 cents to 8.03 cents per litre for diesel, from $1.011 to $1.517 per gigajoule for natural gas and from 3.08 cents to 4.62 cents per litre for propane.

Alberta farmers can have a bit of a sigh of relief because marked farm fuels (diesel and gasoline) are exempt. The carbon levy will apply to natural gas and propane. Farmers may also notice an increase in electricity costs as electricity providers pass along costs through the cap-and-trade system.

In addition to its carbon tax, Alberta has a cap-and-trade system, which it officially refers to as the output-based allocation system that gives large emitters the option to trade and purchase emissions credits. If a large emitter goes over their provincial emission cap, they can purchase credits from other facilities.

"The [Alberta] government is all about net reduction in emissions, so the increase [in the price on carbon] could influence farmers to change some of their practices or upgrade equipment to further increase their efficiencies and improve the management of their costly inputs," says Karla Bergstrom, manager, government and industry affairs, at Alberta Canola. "Farmers may have to take another look at beneficial management practices that are good for both the environment and their bottom line, take advantage of grants for energy-efficient programs, renewable energy projects and green infrastructure. From some of our calculations for farms that are incorporated, the decrease in the small business tax would offset the impact of the carbon tax on those farms. The small sole proprietorships would qualify for the provincial rebate, but it's the larger sole proprietorships and partnerships that would feel the effects of the carbon tax the hardest."

MANITOBA

The Climate and Green Plan has set the carbon tax at $25 per tonne. The Manitoba government expects to implement the tax sometime in 2018. The advantage to this plan is that the tax would not increase yearly, compared to the federal government's carbon pricing backstop. Over the long term, this could save Manitobans an estimated $240 by 2022 compared to the federal carbon pricing backstop, according to a Manitoba government document.

In Manitoba, the carbon levy will not apply to marked fuel used for farming operations.

SASKATCHEWAN

Saskatchewan's plan makes no mention of a price on carbon and the Saskatchewan government has stated that it does not want to tax people.

Through its plan, 'Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy', Saskatchewan will give large emitting facilities flexible compliance options that include making improvements at facilities to reduce emissions intensity, purchasing a carbon offset, reducing GHG emissions, using credits purchased from another facility participating in the emissions trading scheme or paying into a technology fund. Facilities in Saskatchewan that emit more than 50,000 tonnes of carbon every year are already reporting to the federal government and will be included in the proposed scheme.

Saskatchewan farmers can expect some sort of carbon pricing policy to kick in this year or next, whether through a Saskatchewan plan or the federal backstop. Federal backstop rules do stipulate relief from the levy "for gasoline and diesel fuel used by registered farmers in certain farming activities."

— Janelle Hulme is a freelance writer from MacGregor, Man.

Credit: iStock.com/shotbydave

The Hub's top five searched

The Canola Research Hub at **canolaresearch.ca** is a user-interactive database with practical tools designed to return growers' investment in agronomic research back to the farm. This article provides a snapshot of how the site has been used to date.

BY BARBARA CHABIH

The Canola Research Hub is designed to translate agronomic research findings into on-farm practices that improve productivity and profitability. The online library houses over 100 reports and summaries from programs including Agriculture and Agri-Food Canada's Growing Forward 1 and 2, the Canola Agronomic Research Program (CARP), studies funded by the provincial grower groups, and the Ultimate Canola Challenge (UCC).

Visitors to the site come from across the country and around the globe, and traffic has steadily increased each year. Here are the top five most-viewed research summaries:

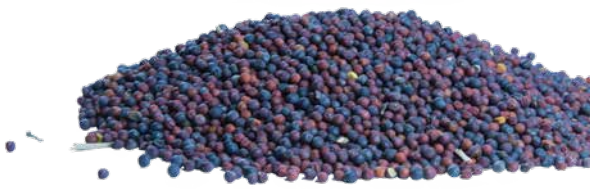
1. **PROJECT:**
   Environmental footprint of canola and canola-based products
   PRINCIPAL INVESTIGATOR:
   Vern Baron, Agriculture and Agri-Food Canada, Lacombe, Alta.

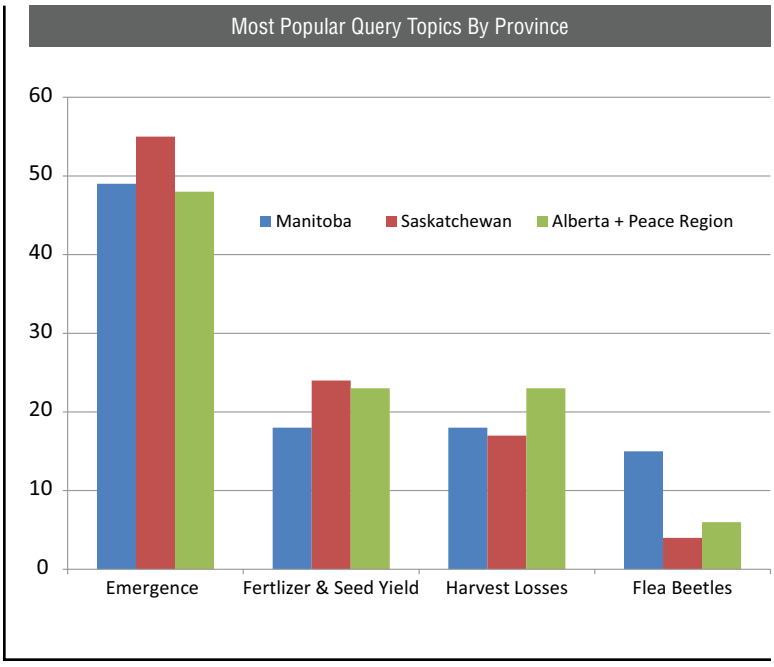
2. **PROJECT:**
   Legume crops to improve soil fertility for enhanced canola production
   PRINCIPAL INVESTIGATOR:
   John O'Donovan, Agriculture and Agri-Food Canada, Lacombe, Alta.

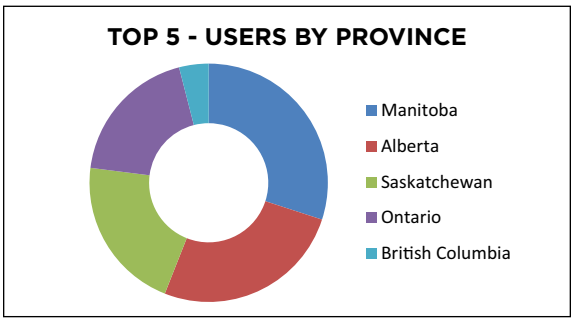
3. **PROJECT:**
   Factors influencing canola emergence
   PRINCIPAL INVESTIGATOR:
   K. Neil Harker, Agriculture and Agri-Food Canada, Lacombe, Alta.

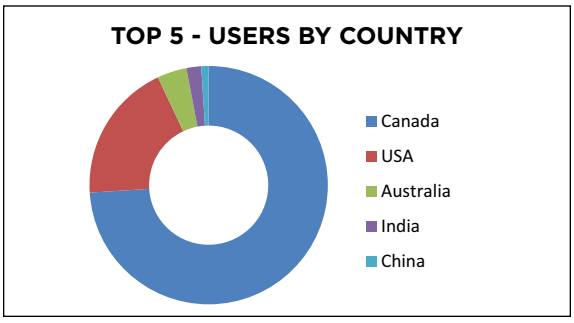
4. **PROJECT:**
   Evaluation of harvest losses and their causes in canola across Western Canada
   PRINCIPAL INVESTIGATOR:
   Rob H. Gulden, University of Manitoba, Winnipeg, Man.

5. **PROJECT:**
   Management practices for optimum canola emergence
   PRINCIPAL INVESTIGATOR:
   Robert Blackshaw, Agriculture and Agri-Food Canada, Lethbridge, Alta.









NAVIGATING THE SITE

To find these studies, click "Search the Hub library" in the Research Summaries box on the homepage at **canolaresearch.ca** and use the Advanced Search option to search by principal investigator.

While there, take time to explore for other studies. Each study is categorized under one of four agronomic research pillars: Plant Establishment, Fertility Management, Integrated Pest Management or Harvest Management. Links are provided where available to full final reports, published papers and downloadable summaries. Advanced search functions allow users to find studies based on other parameters such as timeframe, organization or testing location.

Back at the Hub's landing page, go to the Media box for researcher interviews and video clips, multimedia materials and science-based industry news.

The "Research database" contains a wealth of information that can be analyzed and packaged into dashboards illustrating the science behind best-practice recommendations for canola production. Filtering capabilities allow the user to focus on results that are most relevant to their own conditions and concerns. These dashboards are fully referenced back to each study from which supporting data was drawn.

For more information on using the Canola Research Hub, view the short tutorial "Guided tour" available on the landing page at **canolaresearch.ca**.

The Canola Research Hub, launched in 2015, is a tangible return on the canola industry's investment in this research through the Canola Council of Canada (CCC), government-backed partnerships and grower check-off dollars paid through their provincial organizations.

— Barbara Chabih is communications program coordinator with the Canola Council of Canada. She manages the Canola Research Hub.

Seed size and yield

Larger versus smaller seed could increase crop density and decrease plant mortality, days to flowering, days to end of flowering and days to maturity. Learn more by reading Neil Harker's study "Seed size and seeding rate effects on canola yield and quality" at **canolacouncil.org/links/seed-size**.

FACTORS INFLUENCING CANOLA EMERGENCE
Neil Harker
Agriculture and Agri-Food Canada - Lacombe, AB

"(Don't) go necessarily by a recipe approach (when seeding). Under most conditions, we'd recommend that you seed shallow – about 1/2 an inch – and that you check when you go to a different field to make sure the seeder is set at that depth."
– Neil Harker, Agriculture and Agri-Food Canada, Lacombe

See the full video, and interviews with other researchers, at **canolacouncil.org/links/hub-videos**.

Inside the Canola Research Hub

Looking for canola research and best practices in canola production? Find it at the Canola Research Hub – **canolaresearch.ca**

- Navigate a library of research summaries
- View and filter research data
- Watch video interviews and clips
- Access published resources
- Download multimedia materials
- Keep up to date on science-based industry news and events

The Canola Research Hub has been made possible by the canola industry's investment in agronomic research through the CCC and grower check-off dollars administered by their provincial organizations. It is supported by a $15 million Agriculture and Agri-Food Canada canola research cluster investment under *Growing Forward 2 (GF2)*.
The Hub's library currently houses over 100 reports from programs including AAFC's Growing Forward (GF), the Canola Agronomic Research Program (CARP), studies funded by the provincial grower groups, and the Ultimate Canola Challenge (UCC). This database will continue to expand.

For more information on navigating the Hub, at **canolaresearch.ca**, view a guided-tour tutorial available from the landing page. Or, anywhere you see '?', click to access the FAQs.

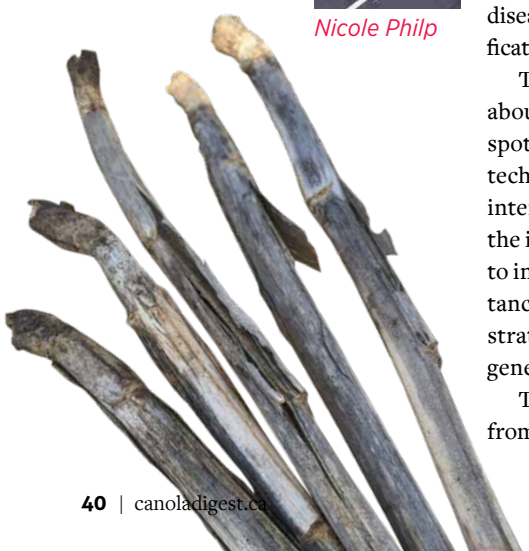
Providing top science for the bottom line.

Disease and seed tips from England

At a recent conference and NIAB meeting in England, CCC agronomy specialist Nicole Philp picked up new ideas on the value of fungicides in combination with resistant varieties and the challenge of losing neonicotinoid seed treatment.

BY NICOLE PHILP

Nicole Philp



In September 2017, my colleague Brittany Hennig and I had the opportunity to go to the British Society of Plant Pathology (BSPP) meeting at the University of Nottingham in England. The conference had a focus on control of disease using genetics (including genetic modification and RNAi), pesticides and biocontrol.

This was an excellent opportunity to hear about diseases in other crops (such as tan spot and septoria in cereals) and learn what technology is being researched. Of particular interest on the agenda were presentations on the impact of new technologies on strategies to increase the durability of disease resistance, on integrated pest management (IPM) strategies, and on the agronomic potential of gene silencing.

The conference had over 160 attendees from more than 15 countries. It was excellent to meet many of the PhD candidates and researchers who conduct the work.

CONFERENCE HIGHLIGHTS

Here are a few of the highlights I took home from the conference:

- Durable disease resistance relies on fungicide to support the genetic resistance. Relying on one alone will not be enough. It is more sustainable to integrate and balance chemical fungicide with crop genetic resistance.

- Tan spot and septoria on wheat can be controlled by the interaction of pathogen gene products called nectrophic effectors (NE), which interact with host sensitivity genes. With this information, breeders have been able to improve disease resistance by eliminating germplasm-carrying relevant NE genes.

Far left: Larvae of cabbage stem flea beetle feed inside a B. napus *stem. Losing neonicotinoids has made managing this insect a major issue for U.K. farmers.* Credit: Simon Kightley

- DNA sequencing is becoming an inexpensive commodity. We are two to three years away from having a disposable $1,000 handheld in-field DNA sequencer.

- Breeding programs must adapt to the reality of disruptive technologies and unprecedented amounts of marker, sequence, phenotypic and meta information.

- Genotyping has become relatively easy; phenotyping remains difficult and limits progress in most marker-trait association studies. Using imaging (high-throughput phenotyping) to determine disease infection (rather than visual observations) could help breeders focus on using resistance that decreases pathogen reproduction.

OFF TO CAMBRIDGE

After the conference, we headed to National Institute of Agricultural Botany (NIAB), a plant science research organization in Cambridge, England. We met with Jane Thomas, who looks after field crop research and pathology, Simon Kightley, who is a researcher focusing on oilseed and pulse crops, and Cheryl Turnbull, who is responsible for the delivery of the winter oilseed rape testing program. We had a few topics in mind to discuss during our time at NIAB, including verticillium stripe, canola variety registration and testing programs, and how the ban of neonicotinoids is affecting oilseed rape producers in England.

The time at NIAB was definitely a highlight of the trip for me. As someone who is interested in variety registration and testing product performance, it was valuable to hear about their comprehensive variety registration system. In order for a variety to be sold in the U.K., it must be on the U.K. National List (NL) or the E.U. Common Catalogue (which includes registered varieties from all members in the U.K.). To be added to this list, varieties must meet two components to the testing program: the variety must be distinct, uniform and stable in performance (DUS test) and show value for cultivation and use (VCU test).

Being on the NL is vital to breeders and seed companies. However, this program tends to look at qualities that differ from what farmers would typically look at. This is where the Recommended List testing program comes in. The role of the Recommended List is to provide relevant, independent information to growers, advisors and end users of varieties. It allows growers to make informed decisions on variety choice, and it promotes continual crop improvement. The data is updated annually. New varieties are added if they offer an advantage and old varieties are removed. I would consider this equivalent to our Canola Performance Trials.

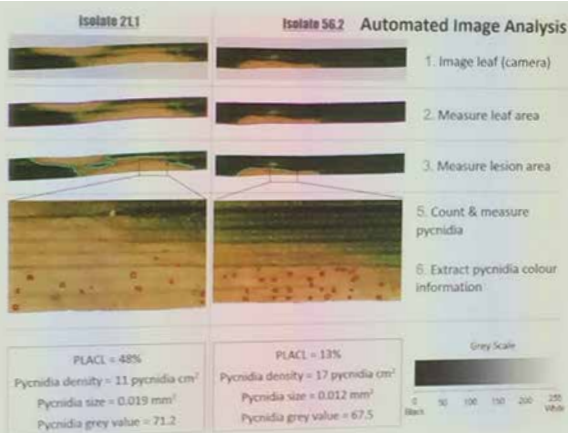
A number of insecticide products that were once registered for use on oilseed rape (OSR) in the U.K. have been banned or become ineffective. Without a seed treatment, U.K. farmers have an increased reliance on foliar insecticides.

We also had an opportunity to discuss how the ban of neonicotinoids is affecting their growers. Of particular concern is the cabbage stem flea beetle (CSFB). Having no seed treatment insecticide options leaves the crop vulnerable during establishment. CSFB damage can range from two to 50 per cent, and even result in total crop loss. In fact, a number of insecticide products that were once registered for use on oilseed rape (OSR) in the U.K. have been banned or become ineffective. Without a seed treatment, U.K. farmers have an increased reliance on foliar insecticides.

Overall, the time in the U.K. was very interesting and educational. Getting to meet some researchers and help connect them to researchers here in Western Canada, and talk about some of the canola-focused research here is always an excellent opportunity.

— Nicole Philp is the Canola Council of Canada agronomy specialist for Southwest Saskatchewan. Email her at philpn@canolacouncil.org.

Below: For high-throughput phenotyping of plant diseases (this is septoria on a cereal leaf), researchers measure lesion area, count pycnidia and extract pycnidia colour information to assess infection levels. With this information, they can rank varieties based on infection levels.



Canola Council of Canada market development efforts have started to move canola from, "What? Granola?" to a recognized premium product in China.

CHINA GETS TO **KNOW CANOLA**

BY JAY WHETTER

When Bruce Jowett asked three years ago to make a presentation on canola to the Chinese Nutrition Society, the society was confused with what he wanted to talk to them about, "What? Granola?"

From that first encounter, work to promote the health and functional benefits of canola in China has paid off. Jowett, the Canola Council of Canada (CCC) vice president of market development, says the Nutrition Society is now adding canola oil to its nutrition standards.

"My job is to first raise awareness of canola oil in China and then differentiate Canadian canola oil from other options," Jowett says. "With enough of the Chinese population saying 'we want canola oil,' it might help maintain stable and open trade."

He still has a lot of work to do. With efforts focused on Beijing and Shanghai the past few years, awareness is starting to tick upward. Thirty per cent of the decision-making 28- to 45-year-old food shoppers in those two big, cosmopolitan cities have now heard of canola oil and eight per cent have used it in the past year, Jowett says, but canola has not displaced other products in home pantries in any big way, yet.

China is a large and diversified market for vegetable oils, which is no surprise given its huge population, regional cuisines with distinct oil tastes and uses, and its variety of

Credit: iStock.com/ooyoo

Below: At the Guangzhou canola oil promotion event in November 2017, Canada's Minister of Agriculture and Agri-Food Lawrence MacAulay and Chef Ken Liang did a Cantonese cooking demonstration using canola oil. Attendees got to witness canola fitting into traditional dishes and to taste tofu deep-fried in canola oil and a noodle dish stir-fried in canola oil.

Left: At the canola media event, Canada's Minister of Agriculture and Agri-Food Lawrence MacAulay shares the traditional Cantonese dishes prepared with canola oil.

domestic oilseed crops. According to the United States Department of Agriculture (USDA), China's total domestic consumption of oil for food use will be 34 million tonnes in 2017-18. This includes 17.4 million tonnes of soybean oil and 8.1 million tonnes of rapeseed oil, the top two.

While China does produce some soybeans and a large crop of rapeseed, domestic supply is well below demand. USDA 2017 data say China imported 97 million tonnes of soybeans and 4.7 million tonnes of rapeseed as well as 700,000 tonnes of soybean oil and 800,000 tonnes of rapeseed oil that year. (Rapeseed stats include Canadian canola.)

China has a long tradition of using rapeseed oil, and Chinese rapeseed breeders have developed some low-glucosinate and low-erucic-acid varieties. CCC canola meal manager Brittany Dyck estimates that these double-low varieties could account for a significant amount of China's rapeseed acres in a year, although quality is highly variable. This inconsistency in quality and taste from the domestic rapeseed supply creates some confusion for consumers and the livestock producers in China, Dyck says. High quality and uniformity of the Canadian crop is the Canadian advantage for canola market development efforts in China, she says.

OPENING UP THE SOUTH

To expand canola familiarity beyond Beijing and Shanghai, the CCC hosted canola oil and meal events in Guangzhou in November 2017. On the Pearl River, 2,000 km south of Beijing, massive Guangzhou is the capital city of Guangdong, the most populous province in China.

Read about the first-ever Canola Dialogue at canoladigest.ca in the January 2018 Canola Digest. The Dialogue, which may become an annual event, is designed to maintain open communication – and hopefully open trade – between Canada and China.

At the Guangzhou oil event, Chef Ken Liang showed how canola oil works well with traditional Cantonese food preparation and taste, and Chinese nutritional expert Dr. Nancy Liu spoke to influencers, key opinion leaders and media on the health benefits of Canadian canola oil. Dr. Liu has been delivering the canola health message for three years in China. She told attendees that cardiovascular disease and stroke are the leading causes of death in China and that 12 per cent of Chinese adults have diabetes. Then she made her pitch for canola oil. "Choosing unsaturated fat, especially monounsaturated fat, is critical for those with diabetes, and plant-based omega-3s can reduce inflammation," she says. "If you have only one oil, make it heart-smart canola oil."

Media representatives at the Guangzhou event took these canola messages and wrote 55 stories that reached 142,680,000 potential readers.

PROMOTING CANOLA MEAL FOR CHINESE HOGS

Nearly 40 feed buyers and ration-mixers from large industrial-sized farms came to the CCC's Guangzhou

canola meal seminar held the day before the oil event. Researcher Martin Nyachoti from the University of Manitoba shared his large body of research on feeding canola meal to pigs in all stages of production.

Brittany Dyck says the event was a chance to explain to these key decision-makers the differences between rapeseed and canola meal. "High glucosinolate levels in rapeseed were reducing inclusion levels for Chinese rapeseed in swine rations," Dyck says. "Our goal is to have leaders in the swine industry identify canola and rapeseed as different, and then to maintain them as separate sources."

To track the success of the meal event, the CCC surveyed attendees before and after the seminar to understand how their views on canola meal as a feed ingredient for pigs changed. Only 21 per cent of surveyed participants currently use canola meal for pig diets and will only use it for pigs in the final stages of growth. All surveyed participants said that the information presented during the seminar will change how they use Canadian canola meal in swine diets in the future.

At the canola meal seminar in Guangzhou, researcher Martin Nyachoti from the University of Manitoba shared his large body of research to nearly 40 feed buyers and ration-mixers from large industrial-sized farms.

ROAD BLOCKS

Canada exported $6.2 billion in agri-food and seafood products to China in 2015, and canola alone accounted for half of it. Through the AgriMarketing Program, the CCC receives funding for its market development and market access activities in China. Market access efforts to increase understanding, to prevent issues by monitoring regulatory changes and to resolve issues are essential for stable and open trade with China.

For one thing, the tariff on Canadian canola seed is nine per cent while the tariff on soybeans is three per cent. (Tariffs are nine per cent for both soybean and canola oil and five per cent for both soybean and canola meal.) Other issues specific to canola include stalled approval of new biotech traits and sanitary and phytosanitary (SPS) issues with regard to blackleg. While Canada and China have a blackleg agreement that extends to 2020, this issue is not permanently resolved.

China is already an important market for Canadian canola and, with a clear need to insert a healthy oil into their traditional cooking methods, the potential for canola use in China can rise. But it takes constant effort. The meal and oil events in Guangzhou in November are just two steps.

Jowett uses a football analogy to describe the market development process: "It takes time to work the ball down the field. You can't do it with one long bomb."

— Jay Whetter is the editor of Canola Digest. He got to join the CCC on the China mission in November 2017. Funding for his travel was provided through Growing Forward 2, *a federal-provincial-territorial initiative.*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VOLUNTEER CANOLA
BRASSICA NAPUS VOLUNTEERUS
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(All growing zones)
GERMINATION TIMING: Early Spring
WATERING NEEDS: Unnecessary
TAKE CONTROL.
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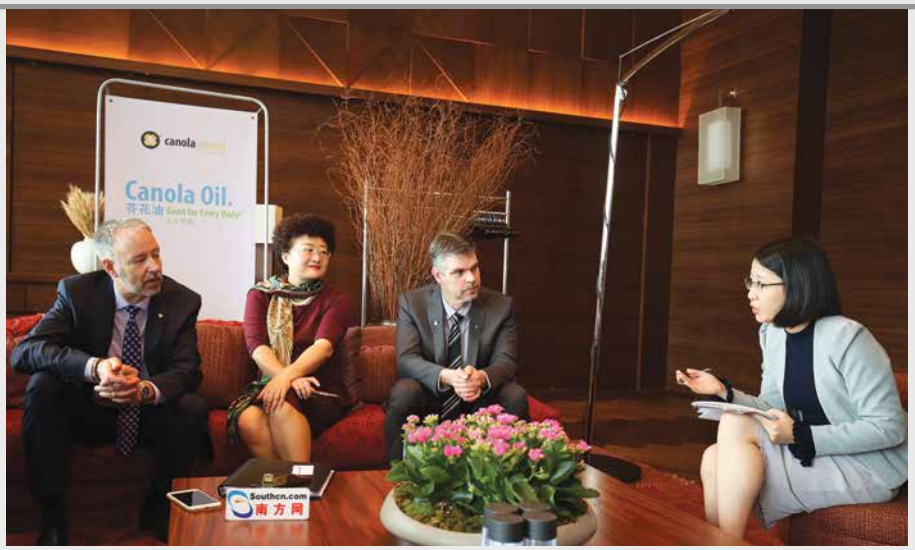

The canola oil event in Guangzhou included a media Q&A session with Canola Council of Canada vice president of market development Bruce Jowett (far left), Chinese nutrition specialist Dr. Nancy Liu and SaskCanola director and Canadian Canola Growers Association director Bernie McClean. The woman on the right is a Chinese journalist.

A FIRST-PERSON ACCOUNT OF THE MISSION

BY JAY WHETTER

I sat in and took notes during a media scrum at the Canadian canola oil promotion event at the Park Hyatt Hotel in Guangzhou in November. Here's one conversation that demonstrates the early stages Canada is at with canola promotion in China.

One reporter asked: What's the use of canola oil in Canadian diets?

Bruce Jowett, Canola Council of Canada vice president of market development, answered: Canola oil is the No.1 oil in Canada, used for salads, baking and frying. It is very versatile in the kitchen.

Reporter: what's the price of canola oil in Canada?

Jowett: Approximately $4 per litre [Which is less than half the price of Canadian canola oil in China.]

Reporter: Is it a high-end oil in Canada?

Jowett: Attributes make it a highly desirable oil and the price is affordable for everyday shoppers.

Reporter: What are the challenges of canola promotion in China?

Jowett: Getting people to know canola and what canola is. It is often compared to rapeseed, but we want people to understand that canola oil has erucic acid and glucosinates removed.

Reporter: So canola is different from rapeseed?

Jowett: Yes it is. We call it canola so people know it's a different product.

While in China, I explored a few markets looking for canola oil. To help in my search, I printed out a little card with "canola oil" written in Chinese. In one neighbourhood store in a warren of narrow streets south of Tiananmen Square in Beijing, most of the oil on offer was sold in five-litre bottles and prices were 60 to 80 yuan ($12 to $16). Options were soybean, peanut, corn and sunflower. No rapeseed. No canola. Another small neighbourhood store in Guangzhou didn't have canola either. But markets in richer neighbourhoods did. I found Canadian brands Canola Harvest and Saporito in Beijing, and Capuli brand at the high-end Ole' supermarket in the ritzy new Tianhe District of Guangzhou. A 946ml bottle of Capuli canola oil was on sale for 65 yuan (or about $13 Canadian dollars). The same supermarket also sold three packs of different oils, packaged in 900ml bottles. A three pack of canola, corn and peanut oils was 85 yuan.

Those combo packs caught my eye because earlier that morning, while exploring old Guangzhou, a woman came up to me in the People's Park and asked where I was from. Clues I was a foreigner: I was reading an English sign. I am tall with curly hair and a Caucasian appearance. I looked lost. (I didn't know where I was, but I wasn't lost. I'm a man.) She introduced herself as Sue.

Her English was pretty good. She had spent many years doing global sales paperwork in English for a Guangzhou company. I took the opportunity to ask her about cooking and what oils she uses. She told me she uses corn oil and sunflower oil. She uses sunflower oil because she read in a magazine that it is "low in fat and good for health". All oil is 100 per cent fat, and it's the fatty acid profile that matters to health. She also read that people should use more than one oil, which is why she buys corn oil. (Sue reads a lot and told me she was quite excited that the new Guangzhou library will let her take out 15 books at a time.)

Sue seemed to know quite a bit about the world and about trade. For example, she said of Justin Trudeau: "Your president is very young. He likes to promote business."

She also said: "People will switch products for health benefit, but the price has to be reasonable." She gave an example of New Zealand honey priced at 200 yuan compared to Chinese honey at 40 yuan. I didn't check on her prices, but her point is the key: "Maybe New Zealand honey has health benefits, but how much more do you have to eat to get those benefits? No one can afford that." But as Bruce Jowett told me later, obviously somebody is buying the New Zealand honey. "Through work and energy, New Zealand has created a market premium that some are prepared to pay." He's says Canada is trying to do the same for canola.

After I returned home, Sue sent an email: "Recently, I watched a western cooking show. A lady cooked a fish with the normal vegetable oil. She said she could taste the fish well, while she cooked the same kind of fish with rape oil, she couldn't taste the fish. The rape oil overpowered the fish taste. Is the taste of rape oil so strong?"

I replied: "Yes, traditional rapeseed oil can have a strong mustardy taste. Canadian Canola and some Chinese rapeseed oil have had the strong taste removed through traditional selective breeding methods. Canola oil has a light, mild flavour, good for frying."

I'll have to email her back to see if she bought a bottle. And maybe told a friend.


Credit: iStock.com/belchonock

What happens if a hired farm worker is injured?

You hire a trusted neighbour for seasonal work. The neighbour gets injured on your farm and can't work again, and his family has to sue to survive. How do you protect the farm and the neighbour's family?

BY JANELLE HULME

You hire a trusted neighbour to help with harvest. This neighbour is a mechanic in town and likes to have the extra six weeks of work to supplement his annual income. You've known him for years. You trust him with the equipment. He works hard and is reliable. It's a great situation.

Then one evening after a long day in the combine, he slips climbing off and hits his head. It happens in a split second, but the resulting brain injury turns out to permanently affect his ability to work. He will never be the same man. He has to quit his job as a mechanic. His wife has three kids to look after. Now she has a husband who can't function as he used to. She can't work. She has no time for that. But their household will be destitute. She has no choice but to sue the farm for damages and to cover her husband's lifetime of lost earning potential. She'll probably win.

Two things can help protect the farm in this situation. Registration through Workers Compensation Board (WCB) and a farm safety program sanctioned by Workplace Safety and Health (WSH). How do these programs work, and what do they cost?

WORKERS COMPENSATION BOARD

WCB provides employers with immunity from lawsuits from employees injured on the job, while also providing workers with wage replacement and healthcare coverage. (Note: WSH could still pursue a case if the farm fails to provide a safe workplace.) In Manitoba, signing up for WCB is mandatory in the scenario mentioned above where the mechanic was hired as an employee.

"If he was only hired as a contractor, then the insurance is optional," says Shereese Qually, Lawyer at Taylor McCaffrey LLP in Winnipeg, Manitoba. "An option for the farmer would be to, by way of contract, require the contractor to confirm they have themselves registered for WCB or carry adequate insurance in case of injury or accident. Or just opt in."

"However, they may have other liability insurance to cover injury of contractors – a general liability policy. One thing that can happen is finding that they actually were employees and should have been registered, resulting in retro premium pay and fines under the Act," says Qually. She emphasizes the importance of obtaining proper insurance so you and your employees or contractors are covered should an incident occur.

An important thing to note about WCB coverage in Manitoba is that family members are excluded under the Workers Compensation Act, according to the Manitoba Government website. Many farmers and ranchers rely on their families to help with daily operations. If an incident occurs with a family member (which can include your spouse, common-law partner, children, parents and siblings), you may want to have extra coverage to ensure everyone is protected, including yourself. Optional Farm Family Coverage with the WCB is available in Manitoba as well as Personal Coverage for farmers with families uninvolved in the business. Now that you know of a few options that are available for Manitoba farmers, how much will all this cost and what about farmers in other provinces?

Average WCB assessment rates for 2018 are $0.95 in Manitoba, $1.19 in Saskatchewan and $1.02 in Alberta. Industries where accidents occur more often will usually pay higher rates.

When an incident occurs

If a worker has an accident on the farm resulting in physical injury, the farmer should try to mitigate any financial damages that might arise as a result of the accident. Andrea James, lawyer with Jamesco Barristers & Solicitors in Calgary, Alta., provides this checklist of steps that every farmer should try to follow in this situation:

- Always offer to take the farm worker to a doctor or to the hospital.
- If the farm worker does not want to go to the hospital, have the individual sign a piece of paper acknowledging that you offered to take the person, but that the offer was declined.
- As soon as possible, write a detailed report of what happened. Do not admit guilt, just state the facts to the best of your knowledge. Sign at the bottom, and ask the injured farm worker to sign as well.
- Notify the WCB and/or your insurance carrier to let them know that there might be a claim.
- If the injury is serious, you may also want to notify your lawyer to let the lawyer know that there is a possible claim. You should seek further advice from your lawyer.

ALBERTA

The above scenario would play out similarly in Alberta. As of January 1, 2016, WCB coverage in Alberta was extended to cover ranch and farm operations with non-family, paid employees. Andrea James, lawyer with Jamesco Barristers & Solicitors in Calgary, says farms in Alberta are required to have a WCB account if the farm employs workers who receive wages and who are not family members. This includes seasonal and casual employees.

If everybody who works on the farm is a family member or is a non-family worker who does not receive wages (for example, this could include a neighbour who helps out occasionally but who is not paid), then they will not automatically be covered by WCB. "It is possible to buy optional WCB coverage for those people, but it is not mandatory," James says.

SASKATCHEWAN

Farms are exempt from WCB coverage in Saskatchewan. However, farms can voluntarily sign up for WCB coverage. "Compared to Alberta, a key difference is that family members are automatically covered by WCB if they receive wages," James says, adding that shareholders are not covered.

WorkSafe Saskatchewan, the WCB's injury-prevention partnership with the Ministry of Labour Relations and Workplace Safety and the WCB's prevention department, have been working with employers in higher-risk industries, such as some farms and ranches, to help put preventative measures in place as part of the Priority Employers program.

"At the end of the day, the job of keeping our workplaces safe is something that every single one of us shares a responsibility in," Phil Germain said in an Occupational Safety article.

"For example, failing to invest in strong safety programs and adhere to preventative measures such as regulated personal protective equipment puts all of us at risk."

When an incident does occur, it is extremely important to ensure you report it as soon as it happens, or within a few days. All workplace incidents must be reported to ensure lawsuits and monetary penalties are avoided.

"As an alternative to signing up for WCB coverage, farmers in Saskatchewan could buy third-party liability insurance," James says.

WITHOUT DUE DILIGENCE, WSH CAN PURSUE

"Remember this is like a quasi-criminal regime where an injury must be reported and Workplace Safety and Health then has the right to investigate and prosecute for any failure to adhere to the WSH Act," says Qually, referring to the scenario at the top of the article.

"The defence here is due diligence to ensure the farmer has adequate safety policies, training, procedures and safety equipment in place. No amount of insurance will cover this failure or address the prosecution if WSH and the Crown choose to pursue it," says Qually. She stresses that an important thing to remember is that WCB insurance or even any other insurance may cover the loss, but a WSH investigation is still possible.

Farmers only need to ensure that themselves, their families and their employees are all covered if an incident should occur. Farmers should also take care to inform workers and keep them up-to-date on safety policies and procedures, to ensure that they have a safe workplace.

— Janelle Hulme is a freelance writer from MacGregor, Man.

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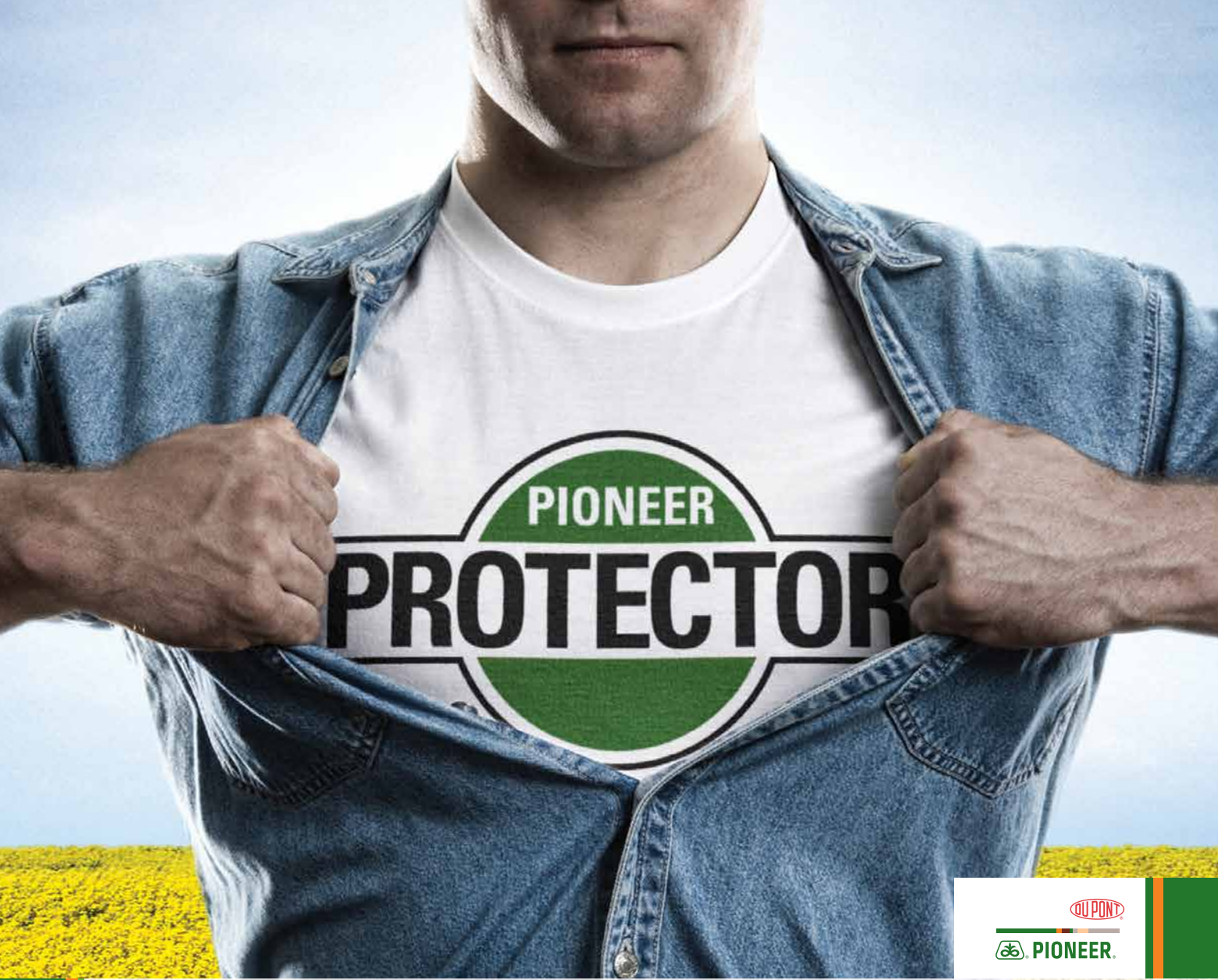

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*Canola yield from a large-scale, grower managed trial in Alberta as of November 19, 2017. Product responses are variable and subject to any number of environmental, disease and pest pressures. Individual results may vary. Multi-year and multi-location data is a better predictor of future performance. Refer to www.pioneer.com/yield or contact a Pioneer Hi-Bred sales representative for the latest and complete listing of traits and scores for each Pioneer® brand product. Genuity® and Roundup Ready® are registered trademarks of Monsanto Technology LLC. Pioneer® brand products are provided subject to the terms and conditions of purchase which are part of the labeling and purchase documents.
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