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SPRING 2018 EDITION

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FARMING SMARTER

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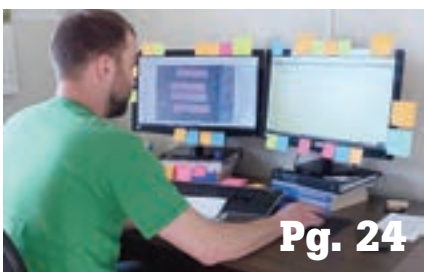

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FARMING SMARTER

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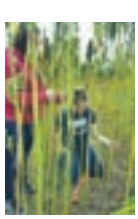

Cover photo:
Lethbridge College students spend a day each fall getting hands-on experience in Farming Smarter fields. This is students helping with the hemp harvest in 2017.

PHOTO: FARMING SMARTER

Research roulette

Let's do this! Good job, good crew and good partners have me pretty stoked about 2018. There's still a lot up in air as far as projects go, but I'm sure we'll be busy. Several major projects came to an end in 2017 including our grain corn and hemp agronomy. Also, a large effort studying winter cereals lead by Dr. Brian Beres with AAFC finished.

What will replace them? Well, we still don't really know. Research is really a lot like roulette. We put in proposals, we partner with people who put in proposals and spin the wheel. We don't get the same quick thrill and it's a lot more work writing a proposal than it is to place a chip on red 19, but it's still a game… I guess.

Ken Coles sharing information about working with the Monosem planter at 2017 Field School.
PHOTO: FARMING SMARTER

We do know that we'll be working on deep banding immobile nutrients and crop sequences that work best with specialty crops (including hemp yay!). We also have the final year of our precision canola study and the dramatic conclusion of the hail study. Some maybes include more work on fusarium head blight, a crop scouting robot and a new and improved on farm research business model that we hope actually works!

In addition to this, we're expanding our work in private contract research, so if you need any done, give us a call!

On the extension front, it's pretty much business as usual except for some date changes. Hope you can make them all! Have a fantastic season!

Ken Coles
Farming Smarter
General Manager

Chair's Message

Questions coming in from the cold

I spent the cold days and nights between Christmas and New Year reading papers on the future of agriculture. Several articles were about the rise of technology and its applications on farm. Everything from blockchain to autonomous vehicles will eventually find its way into agricultural production. The question I have is how will farmers know if the technology proposed for the future of agriculture will give them an acceptable return on investment?

With the rise of the Big Data age and the prospect of drones and autonomous vehicles replacing human labor on farm, who will continue the learning necessary to improve food production?

Agriculture is already a capital-intensive business that has clearly defined expertise in certain sectors. A farmer can't simply change from one season to the next to respond to a fad. Growing living things requires a certain familiarity with the needs of whatever you're trying to keep alive and healthy — doesn't much matter if it's a plant or animal. They all have special needs.

Farming Smarter's goal is to help farms keep abreast of technological advances that improve farm lives and production. Farming Smarter stays connected to Alberta Agriculture & Forestry, Agriculture & Agri-Food Canada, other research associations in Alberta & Canada, industry businesses, agricultural education institutions and, probably most importantly, farmers.

It's a critical role that benefits farmers. In a world where one percent of North Americans farm, agriculture research moves unavoidably down the government funding priority list. This leaves it up to for profit businesses or the farming public to support local unbiased research.

If you get a chance, let your local political representatives know the important role we play for you. We need advocates at large because, as an industry, we've become a very small number of their constituents. Also, if you want to inform the Farming Smarter Board of an issue you want researched, contact claudette@farmingsmarter.com.

Doug Brodoway
Farming Smarter Chair

Regional research grows industry

BY MADELEINE BAERG

Farming Smarter brought together leading agricultural research and extension groups and spearheaded a campaign to persuade the provincial government to commit more dollars to vital regional agricultural studies and farmer outreach. Specifically, they asked Alberta Agriculture and Forestry to invest dollars from the soon-to-be-unveiled Canadian Agricultural Partnership (CAP) to double current funding for regional agricultural and forage research and extension organizations.

"Investing in regional research and extension is one of the very best ways the province can support Alberta's agricultural future," says Ken Coles, Farming Smarter's general manager. "To meet and address the needs of all Alberta's farmers, you have to take into consideration the intricacies and differences in each unique region. Who better to do that than the regional research and extension organizations? We've already proven our capacity and research skill; we've already got necessary infrastructure in place and we've already developed trusting, collaborative relationships with local farmers and industry. We just need dollars so we can leverage and expand on the public-good work we already do."

The federal, provincial and territorial governments are in the final stages of designing (CAP), a five year, $3B bilateral funding framework that will replace Growing Forward II April 1. The federal government completed its portion of the planning, finalized funding allocations for each province, and, in early January, began announcing nationwide programs that will start in April. Now, it is up to each province to determine how best to use federal dollars, for province-specific ag spending programs.

In Alberta, 12 regional agricultural and forage research and extension groups receive funds distributed through the provincial Agricultural Opportunity Fund (AOF). The AOF enhances or maintains human resources (staffing) and extension capacity to promote Alberta's long term agricultural sustainability. The dollars benefit agriculture as a whole, supporting vital public-good, regionally-specific research that meets the different needs of farmers and industry across the province.

But so much more needs to be done.

"Agriculture is a high-cost, tight-margin industry that is under pressure from all kinds of external forces. Building a sustainable industry depends on investment of public dollars," says Coles. "They often say let's leave the research to private industry. The type of work that gets missed is any kind of research that benefits everyone, but is hard to make a profit from. Often, that's some of the very most important research from a public-good perspective."

Rather than waiting quietly with cap in hand, Farming Smarter decided almost a year ago to initiate an industry-wide effort to push regional research and extension higher on the province's funding agenda. Specifically, Farming Smarter is advocating for the province to match current AOF funding with a like-sized contribution of CAP funds.

Called *Regionally Connected Agriculture — Apply, Adapt, Adopt*, the proposal gained support from all 12 AOF fund recipients, multiple crop commissions and producer organizations, the Agriculture and Extension Council of Alberta, and various other industry players.

"They challenged us way back when to go out and get industry support. We did that. The many letters of support written to our Agriculture Minister are a pretty strong indication that the whole industry feels investing in regional research organizations is worthwhile," says Coles.

Individual farmers also want regional research according to the province's own public consultation. The Next Agricultural Policy Framework, What We Heard Report stems from consultations done in early 2017. Released last summer, the report said respondents' rated knowledge and technology transfer as the highest priority within the science, research and innovation category, and third highest in any category only behind enhancing market access and developing market opportunities.

The report went on to say, "There was consensus that there should be an increased focus on knowledge transfer and extension activities under the new framework… It was felt this is an activity both governments and industry organizations have a responsibility to support and facilitate."

Coles feels optimistic that the collaboratively-lead, industry-supported Regionally Connected Ag proposal will make an impression on those working behind closed doors to finalise Alberta's CAP spending.

"There are a lot of things the CAP money could fund," he says. "I just want them to see us as a viable option. Our proposal is a win-win for everyone. Regional research is necessary, it's cost effective and it offers the biggest return on investment. And no one can do extension better than we can."

Financial management
ATB Financial comes through

BY KRISTI COX

Richard Smith (green shirt, top right) took part in WheatStalk July 2017 at Farming Smarter. Here the group listens to wheat breeder Dr. H. Randhawa. PHOTO: SHELLY BARCLAY

Every organization reaches a point where financial management becomes A Thing. A thing that needs careful management, transparent accountability and solid advice for the future. When Farming Smarter reached that level, ATB Financial (ATB), with its grass roots in agriculture, provided a variety of financial services, products and advice to Farming Smarter. It even became a platinum annual sponsor. In return, Farming Smarter connects ATB to farmers. The organizations share some objectives and the exchange creates a partnership that makes good sense.

ATB Financial Southern Region Agriculture Manager, Richard Smith attends Farming Smarter events and commented on the demographics. "What I see with the Farming Smarter group is they connect with the younger, innovative producers who look for practical crop research results and understandable extension information; which Farming Smarter provides. This aligns well with ATB as we also want to grow and expand with that particular sector of producers."

As Farming Smarter expands, it is critical to have a financial organization on its side to manage its accounts and growth. In addition to regular accounts, Farming Smarter also has investment funds with ATB Financial for contingency, capital replacement and a legacy fund. An ATB financial advisor helps manage these long-term funds to provide a solid future for the organization.

"They've been working hard to expand our relationship," says Ken Coles Farming Smarter General Manager. "We now have what I consider to be a multi-pronged relationship. We still have our accounts there, but we've also built some bigger funds that are part of our business growth."

"Rick Deobald, an ATB advisor, helped me set up the accounts," Coles said, "but he also helped our Board of Directors set up the investment policy that includes management, accountability and purpose for each fund. I really like him, He's been really good."

ATB Financial offers services to its clients that extend to the staff level of an organization. ATB offers lower fees to Farming Smarter employees who bank with them and investment information and advice.

ATB Financial staff were also integral in moving Farming Smarter's accounting system into the digital age. A charity needs specific accountability measures and a paper trail for reporting to the government.

"We needed a system for invoices and payroll paid via electronic transfer. Our advisor proved invaluable in addressing how to maintain a dual signatory system in the digital age. The system is automated, saves time and maintains accountability," Coles said.

"ATB is about transforming our businesses," Smith said. "We're obsessed with our customers and we want to be all in. So whatever we need to do to be all in — to help them get to their next level — is what helps us to get to our next level."

ATB listens to Farming Smarter and we're grateful they do.

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Farming Smarter's Garry MacLagan, Claudette Lacombe and Megan Dow helped Dr. Yamily Zavala demonstrate good soil at the Cypress Conference in Oct. 2017.

The Trade Show is always a great place to catch up with folks at our conferences.

Aaron Pritchett performed after dinner at the Lethbridge 2017 conference.

Dr. Mary Burrows showed Cypress Conference goers just how scary wheat streak mosaic can be!

Wayne Lindwall presented Ron Svanes with the Orville Yanke award at the Lethbridge 2017 conference.

Farming Smarter General Manager Ken Coles tells the audience about the corn trials taking place in Lethbridge and Medicine Hat.

Riley Honess tackled the complicated topic of Farmcome Tax for the Lethbridge 2017 conference participants. With tax law changes in the offing, but not confirmed, it was a tricky task.

The ever popular 4-H auction offers an excellent chance to do a little Christmas shopping while at the conference AND raise money for Southern Region 4-H.

Over 200 people came from across Alberta for the two-day conference in early December. Mark Dec. 12-13, 2018 on your calendar to make sure you don't miss next year.

PHOTOS: FARMING SMARTER

Farming Smarter honours Ron Svanes with Orville Yanke Award

Farming Smarter presents an Orville Yanke award each year to a farmer or researcher in the agricultural industry that made significant contributions to soil conservation in southern Alberta. Orville Yanke was a founding member of Farming Smarter.

Ken Coles explains, "The award goes to people who make contributions to either new or better knowledge and there's always been a soil conservation component to it. Ron Svanes practices reduced tillage and is actively involved in a lot of different organizations. He's always been a really stand up guy."

Ron Svanes says, "When they phoned to tell me I received it, I was quite surprised as I've been kind of out of the loop for a while. I'm semi-retired," Svanes said. "I was surprised, but really honoured because the previous award recipients are heroes or mentors of mine."

Svanes is a pioneer in soil conservation methods. His family farm sits between Carmangay and Picture Butte. When he took it over in 1972, it was run with half fallow and half crop. Salinity was a growing concern and wind erosion an ongoing problem.

"It's a fairly sandy soil and there were times when it was just like a big dust bank like the dirty thirties," Svanes said. "They actually had to close the highway a couple of times because there was so much dirt blowing that no one could see. So that's when I realized that something had to be done. Fortunately, I had a peer group with Wayne Lindwall that suggested I get into more continuous cropping."

Dr. Wayne Lindwall presented the award and spoke of his long history with Ron Svanes. They met when they were both attending the University of Alberta 50 years ago and their friendship endured. Dr. Lindwall explained that when he went on to work as a research scientist, he needed farmers who were willing to give access to their land and Ron was a willing partner.

"In many cases they had a hard time to get farmers to permit research where it would be visible and accessible, but Ron was always kind enough to let us impose ourselves near the major roads." Dr. Lindwall said at the award ceremony.

It took time to develop effective methods of continuous cropping, but with improved equipment and chemical technologies, they found success. Svanes stressed that a peer group is key.

Ron Svanes arranged a module for Farming Smarter 2017 Field School that showcased the deep tillage that took place prior to conservation tillage. He brought historical equipment from the Picture Butte Pioneer Village run by the Prairie Tractor and Engine Museum Society where Ron is President. PHOTO: FARMING SMARTER

"You have organizations like Alberta Conservation and Tillage Society and Dryland Salinity Control Association," said Svanes. "You keep getting exposed to more and more information and build up your own confidence. That's how I progressed."

When asked where he thinks things are now, Svanes was optimistic.

"We've come a long way," Svanes said. "In my particular area I would say probably 95 per cent of the farmers on dryland have switched to continuous cropping. You can see the benefits now. We're starting to build up organic matter, have virtually eliminated soil drifting, and I think we've stabilized the salinity if not improved it a lot."

"One thing I get a charge out of — never say never. When we first started out on this zero till thing, we said we'd never till again. I think we're finding now with chemical resistance and weed growth that there are circumstances where we are going to have to go back to minimum cultivation periodically."

It takes ingenuity and flexibility to move forward in this industry and Ron Svanes certainly possesses those traits. Congratulations, Ron, you deserve the Orville Yanke Memorial Award.

A mussel we can live without in Alberta

BY KRISTI COX

Brad Calder, Gerald Ontkean, Troy Ormann, and Paul Graveland (left to right) of Alberta Agriculture and Forestry discussing the treatment procedure during the field trial in the Taber Irrigation District. PHOTO: AAF

ZEBRA MUSSELS

If zebra or quagga mussels get into Alberta waters, it could create a substantial problem for Alberta's irrigation, recreation and ecology. At this point, Alberta is free of these invasive species, but the risk remains high. While preventing the mussels from entering the province is the ultimate goal, it is essential that we have early detection of any occurrence and an assortment of tools to combat them if they become established in the irrigation districts. The Government of Alberta has programs focused on all three areas — boat inspections and public education; monitoring water bodies; and research into control methods.

PREVENTION

Last year, Alberta Environment and Parks (AEP) Aquatic Invasive Species staff identified 19 mussel fouled vessels at border inspection stations. The fact is that just one watercraft could move these mussels into our provincial waterbodies. AEP staff sterilize watercraft found with mussels before returning them to their owners.

The Alberta Government also promotes the Clean, Drain, Dry your Boat message that encourages people to ensure they minimize risk of transporting aquatic invasives. Additionally, they brought in Pull the Plug legislation making it illegal to transport a watercraft with its drain plug in place.

DETECTION

Two Alberta Government Ministries have mussel monitoring programs. AEP monitors natural water bodies and Alberta Agriculture and Forestry (AAF) monitors high risk reservoirs extensively used by boaters and, therefore, have higher risk for introduction of these mussels.

"We traveled to each of these 22 reservoirs and collected plankton samples from boat launches, docks and from the outflow of the reservoir," said Brad Calder, Research Specialist with AAF's Water Quality Section. "Those samples went to AEP for analysis and, at this date, the results are negative."

POTENTIAL CONTROL METHODS

With the consistent spread of invasive mussels across North America, Alberta must prepare for their arrival in Alberta. AAF reviewed multiple forms of chemicals, pH and thermal adjustments as potential mussel control methods. They settled on potash as a preferred method to begin.

Potash is relatively inexpensive compared to the other chemical options and its main use is as a fertilizer for crop production. The potassium ion is the active ingredient in potash and acts as a sedative on mussels that reduces their respiration and eventually causes death. Potassium will kill juvenile and adult mussels, though the adults require higher concentrations.

IRRIGATION PIPELINE STUDY

When the Alberta Government settled on potash as a potential solution to a mussel invasion, research began on how to treat pipelines in Alberta's irrigation districts.

"We conducted pipeline trials where we injected potash-treated water into five pipelines in the Eastern Irrigation District, Taber Irrigation District and the St. Mary River Irrigation District," Calder explained.

The initial trial in 2016 treated a pipeline supplying water to one pivot. Further trials increased in complexity from three to eight pivots on a pipeline and including multiple landowners. This gave valuable insights into what the process might be like in the case of treating an actual mussel invasion. Communication and flexibility were key to the success of these trials.

They used a research potash concentration of 100 mg/L, but recognize that this may or may not be successful at treating invasive mussels.

"There are various research articles that list concentrations from 50 to 150 mg/L. Until we do further toxicology work with invasive mussels in our water chemistry we can't say for certain," said Calder.

There is a similar challenge with determining the time of exposure required to kill the mussels.

"We can't say if it will just be two days or if it will be nine days. We just don't have enough data yet and will require further toxicology studies," said Calder.

Those values can be difficult to determine as results will vary with differing water chemistries and climates. Bringing mussels into Alberta, even for controlled studies, holds a risk of accidental release into the environment, so this has not been done at this point.

Zebra mussel-infested pipe. PHOTO: AAF

SMALL-PLOT STUDY

AAF also conducted a small-plot study at the Alberta Irrigation Technology Centre by Lethbridge to evaluate the change in soil chemistry, crop quality and health after varying applications of potash-treated water.

In 2016, the trial variations were regular irrigation water, 100 mg/L and 500 mg/L concentrations of potassium-treated water applied to 12 plots centered around a single span irrigation pivot. In 2017, the 500 mg/L plots were changed to regular water to observe the recovery of the soil chemistry conditions.

"We believe that crop removal would prevent the accumulation of potassium in the soil profile," said Calder. "The chloride ion that is applied we believe essentially leaches down through the soil profile with the applications of irrigation water and from rainfall."

WHERE TO NEXT?

The study showed that it is possible to inject the required potash solution into pipeline systems and hold it within the pipeline for 48 hours. While more work will determine the exact concentrations and time needed, potash looks like a possible tool for invasive mussel treatment.

"AEP is pursuing registration of potash as a pesticide," said Calder. "The Pest Management Regulatory Agency will review that registration and hopefully approve potash for use as a pesticide for invasive mussels."

One of the next tools AAF would like to look into for mussels in pipelines is freezing.

"If the pipelines can freeze in the winter, then those mussels in the pipelines will die," said Calder.

This would mean that a combination of freezing and potash could be quite effective in protecting the pipelines from invasive mussels taking hold.

"There's still a lot of research left to do and circumstances to look into," Calder said. "This research really allows us to develop a comprehensive plan to move forward in the event mussels should arrive in our districts."

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Rallying against resistance

BY MADELEINE BAERG

Canada is now home to 65 unique cases of herbicide resistant (HR) weeds. Though 2017 weed survey results are not fully tabulated, experts warn the total number of prairie acres infested with resistant weeds probably jumped to over 38 million, an increase of more than 50 per cent since the 2007-09 survey. Integrated weed management (IWM) is the only answer. For it to be achievable on farm, however, it must take agriculture's economic and practical realities into consideration.

"Most of the (resistance issue) is an economically derived problem. Margins are so limited for growers in Western Canada: that's the unfortunate fact of the situation. Growers can't possibly invest money in every area of their rotation because they'd lose all of their profit," says Dr. Charles Geddes, an AAFC weed researcher in Lethbridge.

In Western Canada, tillage is almost a bad word. Tillage has its place if used sparingly where it is needed

The solution, Geddes says, is to pick and choose resistance-fighting techniques based effectiveness and the farm's unique risk factors, history, location, management practices and priorities.

"There are going to be certain areas in your rotation where certain practices are more beneficial. Instead of implementing every possible IWM tool, producers need to choose certain combinations of tools that are most cost effective, most achievable, and offer the most result. That is where knowledge needs to be increased," he says. Also, IWM tools used in combination can increase the efficacy of weed management.

"We've developed the problem of resistance by relying too heavily on herbicides. I don't think the solution to that problem is more herbicides," says Geddes. "Herbicide rotation, so long as it's rotating modes of

Kochia is the glyphosate resistant weed that particularly worries Dr. Geddes. PHOTO: FARMING SMARTER

action, is definitely beneficial over using the same herbicide over and over. And tank mixing has proven beneficial over just using single modes of action. But herbicide rotation and tank mixing are just delaying the problem."

Crop rotation should be a given across all prairie fields, says Geddes. And, producers should do all they can to maximize a crop's competitive edge, from increasing seeding rates, to decreasing row spacing when possible, to optimizing crop in-puts (the latter, ideally, on a site-specific rather than field-wide basis).

Charles Geddes

To make increasing seeding rates economically viable, opt to do so where higher rates will have the most impact at the least cost. For example, while increasing seeding rate is very effective at controlling weeds in multiple crops, it is far more cost effective in cereals than in canola.

Effective resistant weed management also depends on thoughtful consideration of all the tools in the arsenal, including much more intensive scouting, sanitation between fields and, yes, even tillage.

"In western Canada, tillage is almost a bad word. Tillage has its place if used sparingly where it is needed," says Geddes. "There are many weed species that are adapted to zero-tillage. If you have a patch of, say, glyphosate-resistant kochia, going in and disturbing the ground could be a very effective option."

While cover crops are highly effective, they draw vital moisture from dry ground. Their highest benefit is in chem-fallow fields that would otherwise be ideal breeding grounds for resistance. Opt for cover crop varieties with low transpiration to retain as much moisture as possible.

Remember: not all HR weed management techniques need to be complicated or expensive. One of the least expensive tools available to reduce the spread of resistance costs just $0.25: an HB pencil.

"Producers need to be doing more record keeping. If a grower has a suspected resistance case, they should get it tested. Then, they need to make a note of it and keep that in their own records. Even more beneficial, they should let someone else know so it can be recorded in an industry database. The whole industry needs to work together," says Geddes.

It's not just growers who need to do a better job of communicating, however, he adds.

"One of the big things in industry is we need to get better at labelling herbicides with group numbers in ads. As an industry, we could be better at explaining what's in each herbicide so that producers use different modes of action instead of just different names for the same modes. Something needs to change in the industry as a whole: my hope is that it could be voluntary."

All resistant weeds concern Geddes, but the spread of HR wild oats and glyphosate resistant weeds, especially kochia worry him most. Different populations of wild oats now show resistance to six different herbicide modes of action: Groups 1, 2, 8, 14, 15 and 25. While no single population appears to have resistance to all six groups yet, growers need to watch for resistance to multiple modes of action. If a weed proves resistant to a single group, it is more likely to develop resistance to another.

Currently, kochia and volunteer canola are the only known weeds with biotypes resistant to glyphosate in western Canada. However, worse is almost certainly ahead. In Ontario, farmers' increasingly heavy use of GR crops is the likely cause of four weed30 species now boasting resistance to glyphosate.

Almost all kochia in western Canada is resistant to Group 2 herbicides. Now, certain Group 2 resistant populations in Alberta also show resistance to Group 9 herbicides, while some Group 2 resistant populations in Saskatchewan show resistance to Group 4s. Geddes' concern is that triple-resistant kochia populations may soon appear.

Data from grower surveys shows that, in fields with identified resistance, farmers change management practices. While Geddes applauds farmers for making strides to limit the spread of resistance, he says the shift needs to be proactive rather than reactive.

"My hope is that growers start including practices on fields that don't have resistance problems. "Studies show that in the long run, it is more profitable to include non-chemical options that limit your chances of developing resistance than to deal with resistance once it appears." to "Studies show that in the long run, it is more profitable to include proactive weed management that can limit your chances of developing resistance than to deal with resistance once it appears."

Top 10 Most Effective Weed Tools

Here are the Integrated Weed Management practices ranked by Dr. Hugh Beckie and Dr. Neil Harker based on 30 years of weed research.

10. Maintain a database: an invaluable reference guide

9. Strategic tillage: if, where or when needed

8. Field- and site-specific weed management: one size may not fit all

7. Weed sanitation: border control and slowing herbicide resistant gene dispersal

6. In-crop wheat-selective herbicide rotation: combating non-target-site resistance

5. Herbicide site-of-action rotation: avoid back-to-back in-crop ACCase or ALS inhibitor use

4. Herbicide mixtures: better than rotations but not without challenges

3. Pre- and post-herbicide application scouting and surveys: know your enemy

2. Competitive crops and practices that promote competitiveness: natural biological control

And coming in at **No. 1**

Crop diversity: herbicide diversity is not enough!

Pulses still strong for Alberta

BY SARAH REDEKOP

The market for pulses may have flatlined after India's tariff announcements late last year, but the future looks bright as pulse demands are on the rise globally.

"The rest of the world offers some hope, more in the intermediate and longer term," said Gordon Bacon, CEO of Pulse Canada. "What we are seeing is growing interest in the creation of new uses for pulses." Bacon is referring to fractionation; which is the process of milling pulses to extract starches, fibres and proteins. These extracts can be used in a variety of food products, that in turn meet current needs of both producers and consumers.

The interest is evident in Canada — pulse fractionation plants are popping up all over the Prairies. The $400 million Roquette pea plant in Manitoba will be the world's largest pea processing plant. The plan is to have a 250,000-ton per year pea processing capacity. The plant will begin operating between spring and summer of next year.

In Alberta, W.A. Grain and Pulse Solutions' processing plant in Bowden, is undergoing a $15 million expansion. The new facility will fractionate peas and lentils for both human and pet food markets. Another plant in Moose Jaw, Sask. in the planning stages and an ethanol plant in Cavet, Sask. will use feed peas and barley to produce fuel.

The benefits of pulses also gained some attention by Oscar-winning film director James Cameron and his wife. Their company, Verdient Foods Inc., is investing in what will be North America's largest organic pea-processing plant in Vanscoy, Sask. Verdient Foods entered a four-year research contract with Saskatchewan Food Industry Development Centre with an end goal of finding solutions to meet a sustainable global demand for organically grown, plant-based protein.

"The interest at the food level, company level and consumer level is really well aligned to pulse crop attributes," said Bacon. Pulses are rich in protein, low in fat, non-genetically modified and also comply with gluten-free and allergen-free diets. "Elements that define niche demands for food," said Bacon.

"So the short term is traditional markets turned on their ear, but we have already started this process of new uses emerging," explained Bacon. "Canadian use of pulses in this fractionation market will be Canada's second biggest market after China."

As far as India's market is concerned, Bacon said the future is still unclear. "We don't know yet what the triggers will be for the Indian government to drop import duties." The recent combination of high government stocks, high commercial stocks and a good prospect for summer harvest, caused a major impact on both the Indian treasury and domestic prices. Bacon said these factors played a role in India's decision to impose duties on pulses.

Since pulses are the most affordable source of protein in India and pulses sustain most of India's 1.3 billion people, Bacon said clarity will need to come soon. "India has to fine-line between providing price support for farmers and ensuring food costs for consumers don't rise beyond the means of a vast majority of Indian population."

PHOTO: FARMING SMARTER

PHOTO: FARMING SMARTER

"India may be out of the market today, but nobody expects India is permanently gone and no country can meet India's massive import needs the way Canada does," said Bacon. "India consumes probably 200,000 tons of peas per month and you don't wait until the cupboard is empty to order new peas — so at some point, and relatively quickly, India is going to be back in the market for crops."

Precision planter proving itself for canola

BY LEE HART

When considering equipment options for seeding canola, two years of Farming Smarter (FS) research shows a precision or vacuum planter produced higher yields and higher economic returns than an air seeder.

That's not a definitive answer yet — the final year of field research plays out in 2018. But over 2016 and 2017 growing seasons using a precision planter to seed canola at fairly high rates of seed row phosphorous, produced the highest yields. It needs a slight adjustment on the economic front, however, the crop seeded with the planter still out performed the air seeder. Overall, the highest net return came from a seeding rate of 80 seeds/m2.

That's the key message Farming Smarter's Lewis Baarda and Daniel Donkersgoed shared with producers at its 2017 conference in Lethbridge.

The objective of the study is to evaluate the potential of precisions planters, says Baarda, FS research manager. In recent years, farmers have adjusted air seeding systems to be more precise with canola seeding depth and spacing. So, FS decided to launch a three-year project to properly compare an air seeding system with a precision planter. They set the air drill at 9.5-inch row spacing and compared that to the performance of a Monosem vacuum planter set at both 12-inch and 20-inch row spacing.

Seeding rates of 20, 40 60, 80 and 160 seeds/m2 went into the ground. (For canola seed, this could be anywhere from less than a pound per acre to eight pounds per acre).

Canola seeds held in place by vacuum on the Monosem planter. PHOTO: FARMING SMARTER

At pretty well all measuring points of the study, the Monosem planter on 12-inch spacing produced the top results.

Surprisingly there wasn't as much difference among any of the seeding treatments when it came to crop emergence in 2017. "In the first year we saw a big emergence benefit to using the precision planter at 12-inch spacing, but this year was much closer," says Baarda. "With the air drill, the seeds seem to bounce around much more, so we found seeds at varying depths. The planter placed canola seed much more uniformly at the desired depth with proper spacing between seeds."

The highest percentage emergence was at lower seeding rates regardless of equipment. As seeding rates increased however, the per cent emergence dropped more quickly with the precision planter on 20-inch spacing, "because the wider the row spacing, the more closely seeds get put together." But in the end, statistically, not a huge difference considering the range of seeding rates. Most treatments had about 50 per cent emergence. Using the precision planter at a really low rate, and under irrigated conditions could only increase that to about 70 per cent total emergence.

Higher seeding rates produced higher yield for all treatments except the precision planter on 20-inch spacing. Because of the wider rows, 46 bu./ac. yield was the maximum at 80 seeds/m2, but that was still lower than the 53 bu./ac. lowest yield from the precision planter on 12-inch spacing at 20 seeds/m2.

On the economic side, regardless of the seeding and fertilizer rates, the vacuum planter on 12-inch spacing produced the highest gross return with the air drill coming in second and the vacuum planter on 20-inch spacing third. In this research project, the highest net return was pegged at about $650 to $675 per acre produced by the precision planter on 12-inch spacing (The analysis included seed costs, but this analysis didn't include machinery costs or maintenance).

On the fertility front, Donkersgoed says they also evaluated varying rates of seed placed liquid phosphorous ranging from 0 to 60 kg/ha. "We were concerned there might be considerable seedling damage at the higher rate, especially because moving to a wider row spacing makes toxicity an issue" he says. "And there was some reduction in emergence above the 40 kg/ha rate, but not as much as we feared." They wanted to use even higher rates but the equipment wouldn't allow it.

Seeds precisely placed in the soil by the Monosem planter. PHOTO: FARMING SMARTER

Overall, the 60 kg/ha rate reduced the canola yield on the dryland site, but increased the yield on the irrigated site. The highest yield of the different treatments came from the irrigated study planted with the Monosem planter on 12-inch spacing, even with the 60 kg/ha phosphorous rate.

"We are very excited about what this research has shown us so far," says Donkersgoed. "There is still another year to go, but it appears there is potential for vacuum planters to be an optimum canola seeding tool. A planter on 12-inch spacing, might allow producers to reduce seeding rates and still achieve high yields, although it may require higher phosphorous rates than we thought previously."

Free Trade Agreements paramount to Canadian agriculture

BY C. LACOMBE

Free Trade Agreements (FTAs) bring prosperity to the agri-food industry. This is why these agreements hit the front pages as NAFTA and CPTPP grab headlines and sometimes grip hearts.

Trade is now a global activity. Canada either goes after FTAs or eats dust; which is why Brian Innes, Vice-President of Government Relations at Canola Council of Canada called Canada, "one of the most ambitious countries seeking better trade rules in the world right now.

"We are a medium size economy, but we have a large voice." He says we get that large voice from our willingness to trade, to break down trade barriers and increase prosperity through trade. This is in contrast to several countries that have a protectionist stance right now.

"Canada is one of the leading voices for increasing prosperity through more trade. Canada is the most aggressive country in the world seeking measures in trade agreements related to social goals that include all people in the benefits of trade," says Innes.

We also belong to the Cairns Group that works together to make trade flow better.

cairnsgroup.org

The Cairns Group committed to achieving free trade in agriculture since 1986

Australia, Brazil, Canada, Chile, Columbia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Pakistan, Paraguay, Peru, Philippines, South Africa, Thailand, Uruguay, Vietnam

"There is no region in the world where we would not benefit from having more free flowing trade." Of course, there are some places that need what we produce more than others. South America for instance, produces a lot of the same products as Canada. Europe grows its own grain, but wants our livestock products.

"Whatever people choose to eat, whether it's plant based or meat based protein, we're very well equipped to serve them," Innes points out.

There is one region that Innes sees as key to expand trade for Canadian agriculture — Asia.

"We're falling behind other countries that have better access to Asian markets than we do," Innes emphasizes. Asia has growing incomes and Canada could feed the demand for that population. Vancouver and Prince Rupert gives us quick, direct routes to major Asian markets compared to other food sources for that region such as South America or Australia.

Innes sees much work ahead for Canada to get into Asian markets. We only have one agreement signed and in effect in Asia (with Korea). This is what makes the Comprehensive & Progressive Trans Pacific Partnership (CPTPP) vital for Canadian agriculture.

"We need to have better agreements to keep up with our global competitors in Asia." Australia, New Zealand, Peru and Chile all have agreements with China; Canada does not. This puts our products at a disadvantage in that market because we have tariffs that they don't.

Innes says that the benefit of an agreement such as the TPP or the European Union agreement is that provisions within these agreements ensure that Canadian products need only meet one set of requirements to enter any of the countries involved rather than a separate list of requirements for each country.

"There can be many barriers related to technical issues for the regulations of plant and animal health. It's very difficult to have commitments with a single country in these areas. It is much more beneficial and feasible to have agreements in technical areas and feed and food areas when it involves many countries," according to Innes.

He adds that bilateral agreements are not beneficial to agriculture in the long term because trade agreements cover more than just tariffs. Otherwise, farmers might have to choose which country they intended to sell into before they planned a production method for any agriculture product.

Canada's top trading partners

Countries that imported the most Canadian shipments by dollar value during 2016. Also shown is each import country's percentage of total Canadian exports.

1. United States: US$296.5 billion (76.2% of total Canadian exports)
2. China: $15.8 billion (4.1%)
3. United Kingdom: $12.9 billion (3.3%)
4. Japan: $8.1 billion (2.1%)
5. Mexico: $5.8 billion (1.5%)
6. South Korea: $3.3 billion (0.8%)
7. India: $3.0 billion (0.8%)
8. Germany: $3.0 billion (0.8%)
9. France: $2.6 billion (0.7%)
10. Belgium: $2.4 billion (0.6%)
11. Netherlands: $2.1 billion (0.55%)
12. Italy: $1.8 billion (0.45%)
13. Hong Kong: $1.8 billion (0.45%)
14. Brazil: $1.5 billion (0.4%)
15. Australia: $1.5 billion (0.38%)

Over nine-tenths (93.1%) of Canadian exports in 2016 were delivered to the above 15 trade partners. http://www.worldstopexports.com/canadas-top-import-partners/

"Whatever people choose to eat, whether it's plant-based or meat-based protein, we're very well equipped to serve them," Innes points out.

With FTAs in place, Canadian producers can use programs such as https://keepingitclean.ca/. This program shares various crop production requirements for export to foreign countries. It helps Canadian producers grow with confidence that the end products will meet customer needs for quality.

"That includes the production practices that go into food," stresses Innes.

In his view, the most important tasks before Canada at this time are the CPTPP, an FTA with China and resolution to NAFTA. He explains that NAFTA turns farmers from Canada, United States and Mexico into allies rather than competitors on the global market landscape. It creates an efficient food production region that excels in the world. Innes called it a key piece of our success going forward.

He said that at the NAFTA talks in January in Montreal, farmers from Canada, United States and Mexico had a common message.

"We are far better off than we were 25 years ago and we're far better off because we are doing things that make us competitive in the world because we're integrated."

Canada's Free Trade Agreements in force

We also have Foreign Investment Promotion and Protection agreements with some countries.

Country	In Force
Chile	1997
Columbia	2011
Costa Rica	2002
European Free Trade Association	
Iceland, Liechtenstein, Norway, Switzerland	2009
European Union	2017
(Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom)	
Honduras	2014
Israel	1997
Jordan	2012
Korea	2015
NAFTA	1994
Panama	2013
Peru	2009
Ukraine	2017

Source: https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/index.aspx?lang=eng

Agreement definitions

FOREIGN INVESTMENT PROMOTION AND PROTECTION AGREEMENTS

A Foreign investment promotion and protection agreement (FIPA) is a bilateral agreement designed to protect and promote foreign investment through legally-binding rights and obligations. With some exceptions to protect sensitive policy areas, FIPAs ensure foreign investors are treated just like domestic and other third-party foreign investors. FIPAs prevent governments from seizing investments without providing prompt and adequate compensation. They ensure investors are free to bring their capital and returns home if they wish to do so.

FREE TRADE AGREEMENTS

Canadian Free trade agreements (FTA) are treaties that open markets to Canadian businesses by reducing trade barriers, such as tariffs, quotas or non-tariff barriers. They create more predictable, fair and transparent conditions for businesses operating within foreign countries. Canada's FTAs cover substantially all trade between parties to the agreement. Many of Canada's FTAs also go beyond "traditional" trade issues to cover areas such as services, intellectual property and investment. Some countries use the term economic partnership agreement (EPA) instead of FTA. The two terms, EPA and FTA, mean the same thing.

MUTUAL RECOGNITION AGREEMENTS/ARRANGEMENTS

Governments use Mutual recognition agreements/arrangements (MRA) to recognize each other's regulatory testing and certification as valid. Agreements are legally binding while arrangements are not.

MRAs simplify trade by allowing governments to accept the results of certifications by foreign regulators. Such certifications may be related to safety or other issues.

Canada
A nation of misers

BY C. LACOMBE

Miser = a person who hoards money or possessions, often living miserably

General Social Survey on Giving, Volunteering and Participating
http://www.statcan.gc.ca/pub/89-652-x/89-652-x2015001-eng.htm

Generosity in Canada and the United States: The 2017 Generosity Index
https://www.fraserinstitute.org/studies/generosity-in-canada-and-the-united-states-the-2017-generosity-index

When a flood of articles started flashing through my inbox in late November early December about how miserly Canadians are becoming, I took note.

Farming Smarter became a registered Canadian charity in 2015. Since then, we've been looking for ways generate funds for the benefit of our cause. So far, we can't seem to come up with a way to get people to think of us as a charity. Even when we promote the ATBCares donation button that adds 15 per cent to every donation. That's $1 from ATB for every $6.65 you donate to us!

Many of the articles quoted statistics from the Fraser Institute's *Generosity in Canada and the United States: The 2017 Generosity Index* that makes Canadians look very bad compared to our southern neighbours.

But more troubling and relevant is that it also shows a trend of declining donations all over Canada and to every type of charity particularly when taken in conjunction with the *General Social Survey on Giving, Volunteering and Participating* survey by StatsCan.

Apparently, we're not only giving less money, we're also giving less time.

When it comes to volunteer time, it looks as though we're developing a society where only the pre-career young and post-career elderly have time to volunteer. Today, every household needs two career incomes to make ends meet. If you really want to live the life promised by 1960s parents, you need two wage earners per household earning well above minimum wage.

We also started making high school kids volunteer as a requirement for graduation. This might be back-firing on us as they are not continuing the practice after they graduate. Maybe, MAKING someone do something isn't the best way to foster life-long commitment to a cause.

We also seem to have a culture that disparages doing something without getting paid. The only growth in hours volunteered takes place in the senior citizen cohort. The people now over 65 come from a different culture than the people who are currently 35.

Farming Smarter hires students every year through a grant open to Canadian charities. This is Matt Graham and Sara Gateman at work in 2017. PHOTO: FARMING SMARTER

When it comes to giving money, the trend seems to be senior men giving large sums of money; which makes me think they're looking for a legacy. (BTW, Farming Smarter would be an excellent legacy. Just saying). We had some glaring examples of this in southern Alberta. Did you hear of the $2 million donation to Olds College or the $5 million to Lethbridge post-secondary? That's a number that will skew the statistics considering a typical Canadian donor average is around $2,581 annually!

The StatsCan survey shows that senior citizens tend to support religious, health and hospital charities; which probably reflects on life stage. According to the Stats Can report, 40 per cent of donations in 2013 went to religious organizations. These trends make the big donors even more important when the top 10 per cent of donors make 84 per cent of all monetary donations.

I don't like the thought that Canadians are becoming miserly and that it might be something in our culture that is accelerating the downward spiral to a nation of Scrooges. It seems to pile on a growing discomfort I have about Canada becoming a Me First society.

As someone that works in the non-profit sector, I've noticed increasingly that poorly funded organizations take on work that people expect SOMEONE does. Such as manage provincial water resources, do provincial agricultural research or educate our children. Most citizens figure that the proverbial, ill-defined They take care of these necessities without charity organizations. I mean really, when I say charity, what do you think of as charitable causes? Poverty, hunger, medical research and foreign aid, but not caring for our provincial environment or investigating best management practices for food production.

Here's what I've seen over that past 20 years. More and more of the information Albertans need to take care of our environment, food production and social institutions falls into the lap of underfunded organizations that most people don't know exist. Industry is all over the research and development of new products to meet challenges, but they are motivated by profit (as business must be).

Most non-profits begin as a small group of local people that see a need in their community and create a plan to address it. Often it is something that requires money to do, but nothing to sell. Some of these grow into larger organizations and some become charities. If Albertans (and Canadians) want someone conducting unbiased research without industry influence (read cash), they need to change something. The public either needs to accept higher taxes and lobby the government to do the necessary research or they need to start donating to organizations that look after water, food and social policy.

But if everyone is struggling to survive, that doesn't bode well for charity or for that matter Canadians. According to Statistics Canada, for every $1 of income a Canadian earns, they have $1.68 in debt. Maybe we're not miserly; we're just poor!

I think another reason this decline in charitable giving struck a nerve for me is because it seems our society is becoming less kind over all. I fear Canada is becoming less kind, less generous and less polite and I don't like it.

Y'all need to make me feel better by donating to Farming Smarter NOW.

Autonomous Agronomist scouts fields

BY LEE HART

While Big Data and new technology often come with promises to make life easier, simpler and more efficient for farmers, is any of it really creating more hours in a day?

There are tonnes of data generated for precision farming and lots of well-intentioned high tech tools reducing hands-on manual labour. Some of it also lets farmers see the land and crops from heights and angles they've never seen before. But is it all being used to its potential? Is it all being helpful in day-to-day operations?

Farming Smarter proposes that a new piece of programmable technology can put boots (or at least wheels) on the ground and produce consumable information. If funding and plans proceed, the Lethbridge-based applied research association hopes to develop and test a field robot idea they dubbed the Autonomous Agronomist in 2018.

"There is so much technology coming along these days, that in many respects it becomes overwhelming," says Lewis Baarda, Farming Smarter's on-farm research manager. As a specialist in GIS and agricultural data collection, statistical analysis, field mapping, remote sensing and other agricultural technologies, he's familiar with the volume of information producers face.

"All the data and technologies can be good in their own right, but we asked ourselves what would be really useful? What would really make a difference in day-to-day operations," asks Baarda?

Robots, also known as ground-based drones, or properly categorized as UGVs (unmanned ground vehicle) already exist with a wide range of applications. Some are as tame as the Roomba-type robots that wander around many living rooms vacuuming floors, other robots provide mine-safety inspections, others perform bomb disposal and hazardous package retrieving duties for first responders and still others are armed and provide surveillance services used by the military. Farming Smarter envisions using some version of a UGV to collect crop-relevant information from the field.

"The basic technology for a ground-based drone is already out there," says Baarda. "We are interested in modifying some of that technology to collect certain types of data from the field.

"One of the biggest challenges facing producers at certain times of the year is workload and work flow," he says. "Particularly during the growing season, it's about trying to get everything done, within a certain window, on a timely basis. We want to know if there a place for a UGV out in the field making observations and perhaps collecting information that might actually save a producer time."

Both Baarda and Farming Smarter general manager, Ken Coles, see potential for the Autonomous Agronomist to make observations and collect routine field data. It could collect soil samples, take soil moisture and nutrient readings, collect tissue samples and with a camera assess weed pressure, observe disease pressure, pest prevalence and pest damage.

"Time and workflow during certain seasons is the issue," says Baarda. "Also as farms get larger some fields might be one to two hours apart. The robots might help reduce travel time. We'd like to answer the question — is there a practical role for a ground-based drone that could collect information and provide useful and timely information to a producer that would actually save time?"

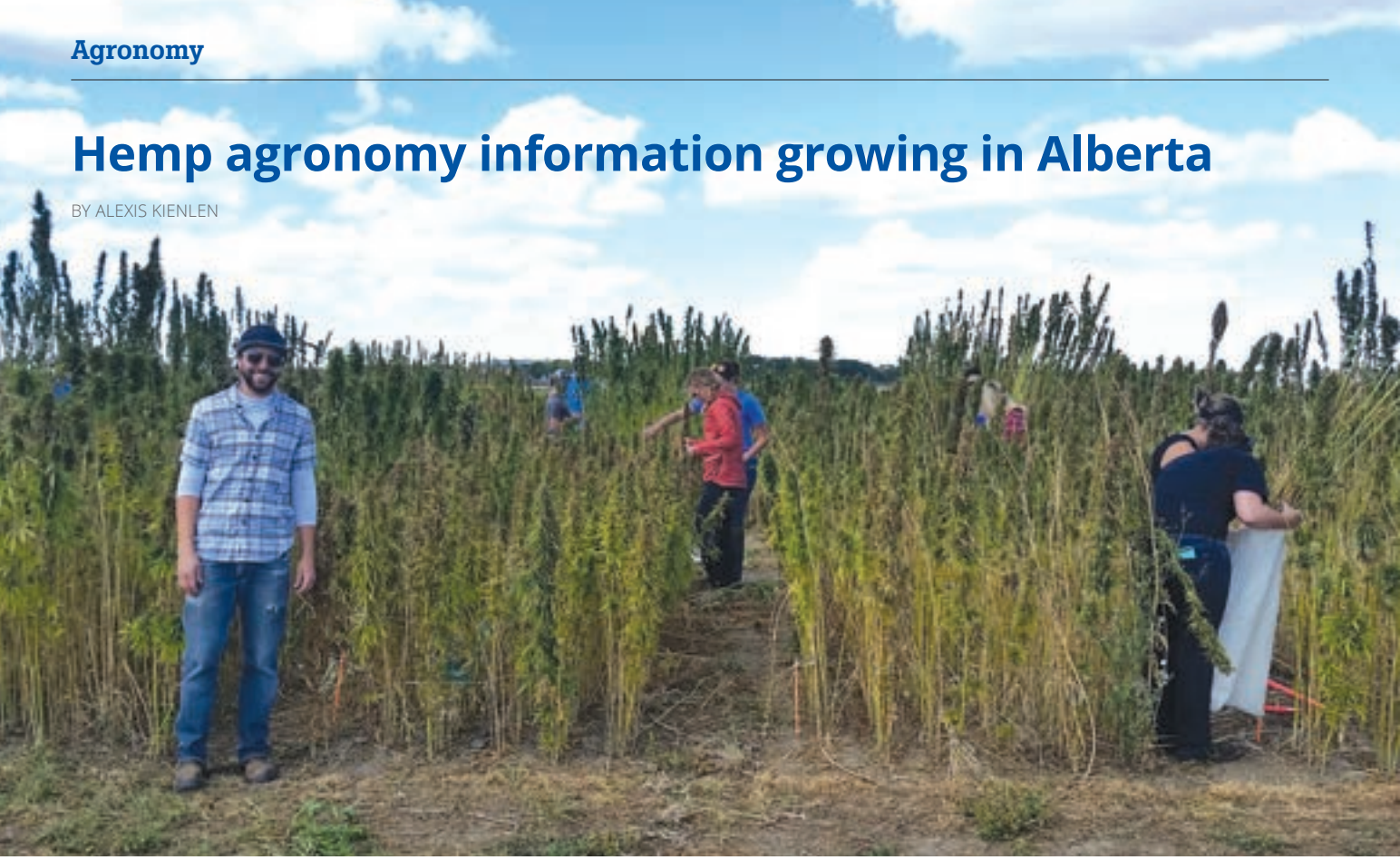
"Aerial drones provide an observation of the crop at a certain distance above the field. We see a properly modified and programmed UGV as a tool that could scout crops for the farmer," says Coles. If it can work, it would actually interact with the environment collecting timely information that could help make crop management decisions.

Coles says UGVs also wouldn't face the regulatory issues that apply to aerial drones and, because they're larger than the flying counterparts, they could be outfitted with gas engines, or larger batteries for more operating hours.

Farming Smarter summer student Sara Gateman performing one of the tasks an Auto Agronomist might do. PHOTO: FARMING SMARTER

Hemp agronomy information growing in Alberta

BY ALEXIS KIENLEN



Mike Gretzinger supervises Lethbridge College students that come each year to aid the hemp trails harvest. PHOTO: FARMING SMARTER

Farming Smarter hemp trials show that hemp can grow as well in southern Alberta as other applied research sites in the Peace and in Vegreville.

The three locations had some interesting differences. The Peace Country extended daylight hours and can produce more fibre. While southern Alberta can produce more seed and Vegreville is the best of both worlds. Southern Alberta trails are irrigated, while the other two research stations are not.

"Under irrigation, we saw some big advantages," said Mike Gretzinger, research co-ordinator at Farming Smarter.

The project began because Manitoba Harvest had started contracting 20,000 to 30,000 hemp acres from across southern Manitoba, Alberta and Saskatchewan for growing hemp hearts (hemp seed). There was data available from Innotech, but nothing for southern Alberta.

"They were still working on the production manual and didn't have all the agronomic details worked out," said Gretzinger.

Farming Smarter performed seeding trials, fertility trials and a variety trial. They didn't use any herbicide other than burndown, making hemp one of the first crops that they've grown organically.

"There were some big differences between what we were told we were going to see and what we actually did see. In some cases, we were pretty surprised," said Gretzinger.

Hemp needs a lot of nitrogen to grow a large biomass and seed, but at a certain point, most of the nitrogen goes to the biomass.

"You'll get more seed, but you'll also increase your biomass," he said.

Increased biomass can result in harvest management issues. The fertility trials tested, 0, 30, 60, 90, 120 and 150 pounds per acre. Higher amounts resulted in more biomass and a higher seed yield.

"I did a little economic analysis. It was well worth it to spend the additional cost of nitrogen to justify 10 bushels an acre to increase hemp yield," he said.

The trials included Finola a seed specific variety, Silesia a fibre purpose variety and X59 a dual purpose variety. Hemp does not contain any THC; which is the active chemical in its cousin from the bad part of town.

Finola is short with small stalks, while Silesia is tall and used for pulp and paper. Silesia proved a challenge to harvest as it wrapped around the combine.

Gretzinger said the research team found an incredible difference between varieties and classification isn't as clear as it is in a crop like wheat.

To calculate the worth of varieties, producers should look at the harvest index; which is the seed yield divided by the entire biomass of the crop. Finola's harvest index is .37 and Silesia's is .18, with about 2-1/2 times the amount of biomass.

Most growers still prefer shorter varieties with a high harvest index, said Gretzinger.

The seeding rate trials contained one surprise. Most people don't seed hemp until after the May long weekend. In the seeding rate trials, researchers found that later-seeded hemp had less biomass. Many people seed later because they want to deal with less biomass. But seeding late also limits seed yield.

"A better strategy would be to pick the shortest, easiest to harvest variety," said Gretzinger. In six out of nine site years, May 15 was the best seeding date for yield and nothing seeded in June did better than anything seeded in May.

Anyone who grows hemp for the first time should try a few different varieties and management styles. Hemp doesn't do well in compacted soils, so it's important to have a good seed drill and go slow. Hemp does grow really well once it is established, so incropping is not necessary. Hemp should be seeded shallow, just like a canola crop.

Farming Smarter will continue with another hemp trial and will do a long-term sequencing trial to see how best to work hemp into other rotations.

On-line marketing platform

Ag Exchange Group formally launched its CXN360 grain marketing platform brand for grain growers in January 2017. The technology company created the online solution to give growers access to global buyers in a transparent and open market

"Our grower members have 24/7 access to all the bids and asks on our system from growers around the globe," says Mike Witkowicz, Vice President of Strategy and Business Development at Ag Exchange Group. "They're finding new ways to market their grain and finding new benchmarks for profitability in their operations."

"The CXN360 brand is about giving growers and buyers choice. We let them choose timing, price, and process," added Witkowicz.

Ag Exchange Group creates transparent, open, accessible and reliable agricultural commodity markets by facilitating two-way bids and offers between agricultural producers and buyers. The CXN360 online platform allows producers to see bids from all buyers in real time and create their own asks to sell crop inventory on their own terms. www.agexchangegroup.com.

Stubble helps to trap snow and provide spring moisture on the prairies. PHOTO: C. LACOMBE

PHOTOS: FARMING SMARTER

Mike Gretzinger teaches Lethbridge College students how to do biomass on hemp on one of their three days of hands on learning.

Jamie Puchinger works with Matt Graham and Sara Gateman on the set up of Diamondback moth traps.

Summer student Jazlyn Petersen was ecstatic to drive the combine.

Participants at Open Farm Days learn about crops from local seed growers Kelly Barany and Chelsea Hubble from Chin Ridge Seeds.

Farming Smarter staff stretching more than their minds; L-R Megan Dow, Chelsea Hubble, Sara Gateman, Jazlyn Petersen, Matt Graham & Saikat Basu (front right).

Toby Mandel going back in time during filming of the OWC goes to Hollywood film project.

Ken Coles and participants of the June Plot Hop look at seed plates on the Farming Smarter Monosem planter.

Statistics save the day in ag research

BY JENNIFER BLAIR

When it comes to ag research, just about as much work is done on a computer as is done in the plot.

"There is a lot of boots-on-the-ground work in research, but setting up that trial in a way that helps us control variability and understand the results is as important as the field work," said Lewis Baarda, on-farm research manager at Farming Smarter.

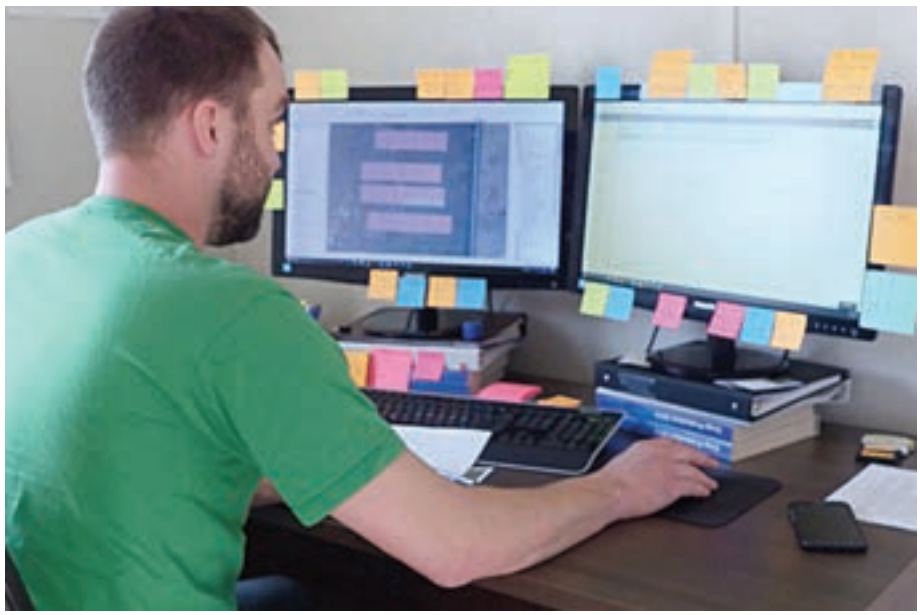
"As researchers, our job is to dig through all the noise and see what's really going on. We do the best job that we can to isolate information out of the noise.

"It's essential to what we do." And much of that essential work is focussed on managing variability through statistics, he said.

"Results can be confounding," said Baarda. "We see variable effects in variable environments, so we want to control that variability as much as possible. And statistics tell us how well we've done that."

If, for instance, researchers see different results from the same treatment, statistics can help them understand whether the variability is because of a flaw in the experiment or some other random factor like subtle differences in the soil, ground slope, or precipitation levels.

"Statistical rigour helps us ensure that the results we see are real and that they're repeatable — that we can expect to see them somewhere else," said Baarda.



Lewis Baarda has his own system for dealing with complex sets of data. PHOTO: MORTON MOLYNEUX

"It gives us a certain level of confidence in our results." And that starts with proper research design

"We're not just coming up with a number. It didn't just happen because it was the right year or the right location or whatever random error might have happened during the experiments.

"It gives us a certain level of confidence in our results." And that starts with proper research design.

"Two of the big facets of research design — particularly in small-plot research — is randomization and replication," said Baarda. "By randomizing the things that we test, there's less of a chance of systematic error and replication gives us confidence that what we see isn't just a random blip one year.

"It's a built-in mechanism to verify that those results are real." For instance, Farming Smarter might test four different herbicides at five different rates over eight different site years — "either eight different locations or the same location eight different times, or some combination of both."

"Site years is just another way to have the same experiment conducted in different environments, different weather conditions, and different locations," said Baarda.

"It's just like in your own field — you might do the same thing and have the same rotation every year, but in different years get different results.

"By replicating our trials and randomizing our treatments, we mitigate the effects of any errors or deviations on the final results." And statistics can help researchers parse out whether those final results are valid or not.

"Sometimes we see results and think, 'This isn't what we expected to happen.' But when we run the statistics, they might tell us that what we're seeing is actually happening, even if we didn't expect it," he said.

"Without the statistics, it's really tough to know whether the differences we see are because of the experiment or because of something else. "It motivates us to dig a little deeper and ask what we're missing or not understanding. That's how we learn things."

Producers can use those same principles in the "The basic tenets of on-farm experimentation would be replication and randomization," he said. Producers often do a single check strip and cross their fingers that that will give them the answers they need.

"That may give you some qualitative data, but if this is something that you're going to make decisions on for your own operation in the future, you're going to want to stick to the tenets of experimental science," said Baarda.

"You need to replicate things — have four check strips and make sure it's not just one check strip that happens to do better or worse than the rest of the field." And while statistical rigour is "just part of the process" at Farming Smarter, not all research projects follow the same standards, he added.

"As a producer, you need to be skeptical," said Baarda. "You want to ask those challenging questions. If somebody has some results, ask who did the research, what standards they adhere to, and how the trial was designed.

"There's a lot of pseudoscience out there and you want to be sure you're getting your information from a trusted source."

Agri-Food sector makes Alberta strong

BY JAYLENE ULMER, DIRECTOR

MARKETING AND BRAND STRATEGY CHOOSE LETHBRIDGE

The agri-food sector in southwestern Alberta continues to make key contributions to the regional economy and the province's prosperity.

The 2016 Census of Agriculture says total gross farm receipts exceeded $2 billion in Lethbridge County, up 90 per cent from the previous census and represents 11 per cent of the provincial total. Other key numbers from Lethbridge County are total farm capital up 63 per cent to approximately $5.2 billion and all livestock & poultry value up 204 per cent to approximately $1.1 billion.

The County is also the only census consolidated subdivision in the province with total gross farm receipts greater than $1 billion and its total is 106 per cent larger than the next closest comparable subdivision. Across the board, growth in these areas outpaced that of the rest of the province.

While these numbers are positive, it's also important to acknowledge the challenges facing the agri-food sector in Alberta, particularly beyond Canada's borders, such as ongoing restrictions on the export of pulses to India and continuing uncertainty around the fate of NAFTA. Helping producers and processors in south western Alberta meet those challenges is a goal at Economic Development Lethbridge.

We continue to build strategic partnerships that focus on the long-term future of the Lethbridge region as an agri-food hub, especially in value-added processing. For example, our work with the Plant Protein Alliance of Alberta to develop a common vision, plan and strategy to promote growth and investment in high-value ingredient (plant-based) processing sector in Alberta. Regional partnerships like this will advance Alberta's status as the breadbasket of the nation and as an important exporter of safe, quality agricultural products to the world.

The current strength of southwestern Alberta's agri-food sector is a solid foundation for future growth and investment. Lethbridge has the added advantage of being home to two post-secondary institutions with close industry connections and the willingness to respond to the needs of the industry. The recently established Cor Van Raay Southern Alberta Agribusiness Program, a joint offering of the University of Lethbridge and Lethbridge College, is an example of this collaborative and forward-focused approach. With our strong local economy, a stable housing market, and a young and growing population, Lethbridge continues to shine as southern Alberta's hub for both traditional industries like agriculture and emerging technologies. At Economic Development Lethbridge, we believe our work educating investors about the opportunities in southern Alberta will pay long-term dividends and support the further growth and diversification of our economy.

Follow us on twitter @chooseleth or email info@chooselethbridge.ca if you have any questions. We look forward to connecting with you.

Perfecting your Farmcome tax strategy

BY MADELEINE BAERG

Last summer, Canadian farmers and ranchers found themselves caught in the crossfire when the federal government announced plans to close 'unfair tax loopholes' they argued were exploited by 'wealthy small business holders.' Though intended to force physicians, lawyers and other highly-paid professions to pay up, the proposed changes would have hit agricultural businesses squarely. By December, the government bowed to intense public pressure and backed down on the majority of the controversial proposals. Still, the months of intense and unhappy uncertainty last fall and the lingering questions that remain should remind farmers of the value of proactive and continuous tax planning.

"There was a lot of worry after the July release on proposed changes to the Income Tax Act. The proposed rules were very complex and subjective; which led to a wide range of effects for all farmers," says Riley Honess, a tax manager with KPMG in Lethbridge who specializes in farm business taxation.

On the positive side, Minister Morneau announced in October that the federal small business tax rate would drop by a total of 1.5 per cent by 2019, stepping 0.5 per cent down to 10 per cent in 2018 and then dropping a point further to nine per cent the year after. In Alberta, that means the combined small business tax rate would move from 12.5 per cent to 11 per cent by 2019.

Also good news, the government announced in October and reaffirmed in December that it would scrap all plans to restrict the use of the lifetime capital gains exemptions and restrict the conversion of income to capital gains. Further, it announced that it would simplify its previously announced income sprinkling rules.

"There was a lot of concern regarding the tax on split income rules (TOSI) and the rules around limiting the use of the lifetime capital gains exemption as this is a common tool used by farmers," says Honess. "In December, they gave more clear guidelines on TOSI. There is definitely less worry out there now as these rules are no longer as far-reaching."

Called 'bright-line tests,' the new TOSI details released in December allow a family member to automatically avoid previously announced income sprinkling rules if they are:

Riley Honess

- the spouse of a business owner, so long as the owner is aged 65 years or older,
- an adult aged 18 or older and have made a meaningful labour contribution (generally defined as working with the business an average of at least 20 hours per week) during the operating season in the current year or during any five previous tax years,
- an adult aged 25 years or older and have a significant financial commitment to the business (i.e.: they own more than 10 per cent of the votes and value in the corporation), or
- an individual who realizes a taxable capital gain from the disposition of qualified farm or fishing property.

Not all is lost if a family member does not qualify under the new reasonableness clauses, reminds Honess. "If children of farm families do not qualify under the bright line tests, there is always the option to pay a fair wage based on work completed; however, this also must be a reasonable amount."

Uncertainty remains surrounding the feds' ongoing commitment to tighten rules regarding passive investment income. The government's intention with this proposal is to restrict businesses from tax sheltering income from things that for most businesses don't directly contribute to business growth, such as real estate rentals, dividends and investments.

In farm businesses, however, passive investments may be pivotal to business success. Many farm businesses depend on passive investments to help protect from agriculture's many uncertainties and/or to weather business transitions (succession planning or retirement, for example). As such, changes to passive income taxation could fundamentally impact at least some farms' viability.

Passive income taxation changes may also impact the income farm businesses increasingly earning from solar power, oil and gas well and wind mill leases.

"I do have some concerns in the area of passive investment income because there are a lot of unknowns right now," says Honess." The government did announce a $50,000 safe harbour and that they would grandfather current investments under the old rules. However, there is still a lot of uncertainty."

Honess expects passive investment income details will not be released until the upcoming federal budget. It also remains uncertain, he says, whether the government will release draft legislation and then accept more public consultation, or whether it will just announce and immediately implement the new rules.

The intense taxation discussions that have occurred in government backrooms, in coffee

"There was a lot of worry after the July release on proposed changes to the Income Tax Act. The proposed rules were very complex and subjective; which led to a wide range of effects for all farmers." *— Riley Honess*

shops, and across farmers' fence-lines over the past half year highlight one clear truth about agriculture: farm taxation, like the farm businesses it works upon, is multilayered and often complicated.

Farm tax planning can be particularly challenging, especially at succession planning time, because farm businesses often include complicated family dynamics. And because life and a farm business are typically so intertwined, it can be hard to separate one from the other for tax purposes, says Honess.

If at all possible, a trusted financial advisor should be involved in reviewing taxation implications prior to major changes in life or business including, marital changes, any diversification or major operating change in one's farm business, major capital purchase or sales, and succession and estate planning.

"There are specific rules for farmers in the Income Tax Act that are complex, such as family farm roll-over provisions. You need to be educated in ensuring you qualify for such rules," says Honess.

Getting the most value from your relationship with your accountant depends on open communication.

"It really helps when farmers are educated about their tax situation and ask good questions. They should be questioning what their accountant is doing to make sure that they are on the same page and their farm objectives are being met."

And, keep your long term plans firmly in mind.

"The more I see, the more I realise everyone has different objectives and different ways to get there. It is important to first consider your farm's objectives and goals and then have an appropriate tax plan and structure put in place to meet these objectives.

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Research with a southern Alberta focus

BY LEE HART

Agrisoma carinata plots at Farming Smarter. PHOTO: FARMING SMARTER

2018 APPROVED OR ON-GOING RESEARCH PROJECTS

Farming Smarter received a grant to conduct research into how to introduce higher value speciality crops into rotation. For example, how or when do you bring a crop such as hemp into the crop sequence?

A new longer-term study will look at whether less mobile crop nutrients such as phosphate and potassium get concentrated in the upper profile of the soil under conservation farming practices (zero or no tillage). In this project, thy will deep band the nutrients (about six to seven inches deep) every three years and compare crop performance on treated and untreated plots.

Farming Smarter will also wrap up its four-year study on the impact of hail-recovery products, such as fungicides and nutrient blends, to determine if they had an effect. Farming Smarter has its own tractor-mounted hail simulator that simulates various degrees of hail damage.

The 2018 research plots will again demonstrate updates in breeding and production practices of mustard and Brassica Carinata. Agrisoma, a lead carinata marketer, spearheaded breeding work at Agriculture and Agri-Food Canada over the past few years. It is an Ethiopian mustard that grows well under dryland prairie conditions and has excellent properties to produce biofuels from the oil as well as protein for livestock feed.

PENDING RESEARCH

If the good Lord's willing, the creek don't rise and funding becomes available, Farming Smarter has a couple new research ideas it would like to launch in its 2018 program of applied research.

Investigating the role and value of an on-the-ground field scouting robot, dubbed the Autonomous Agronomist, is a novel concept among research projects that Ken Coles, Farming Smarter general manager hopes will receive funding for the coming growing season.

The Autonomous Agronomist project would adapt commercially available robot technology, or UGV (unmanned ground vehicles) to perform a range of field scouting functions (see related story) collecting valuable information from the field. That information could then be relayed to the producer, providing timely information that could help make crop management decisions.

A funding application is with the Canadian Agricultural Automation Cluster funded by Agriculture and Agri-Food Canada.

Whether you're a producer or another crop research organization, Farming Smarter hopes to offer to teach how to design and run field-scale research trials as research facilitator starting in 2018.

The not-for-profit applied research organization applied for funding to launch a pilot as a field scale research facilitator service. The Farming Smarter name has only been around for a few years, but the organization has deep roots in very practical research efforts as it grew from the merger of the Southern Applied Research Association and Southern Alberta Conservation Association in 2012.

"Aside from our own research programs, we hope to take what we know and offer another level of research services," says Coles.

He sees Farming Smarter offering services to not only help producers design, but if requested also manage on-farm research trials whether it be field scale plots comparing different farming practices, different products or different rates of products on home field conditions.

"The idea is to train producers or perhaps other organizations how to set up proper field scale trials," says Coles. "Perhaps the farmer is interested in someday offering his own research services. I can see this project eventually creating a whole network of producers or business partners who understand proper field-scale research."

Coles says their field-scale research expertise might also help other organizations — government, university, or private — who concentrate on smaller research-size plots and want to put those findings to test under field-scale conditions.

"We have the expertise and we have the equipment to run everything on a larger scale," says Coles. Farming Smarter applied for funding from Alberta Innovates and Alberta Pulse.

Do not build green bridges

BY SARAH REDEKOP

Taking a look to our neighbours across the border may provide valuable insight about the causes of wheat streak viruses and how to help manage the diseases in our own crops. Dr. Mary Burrows, a plant pathologist University of Montana, studies the development of the disease and spoke at Farming Smarter Cypress conference October 2017.

Montana saw severe outbreaks of the wheat streak mosaic, wheat mosaic and triticum mosaic viruses in 2015 and 2016. Widespread hail damage and above average fall temperatures and precipitation helped create a green bridge for the virus said Burrows. "Our most severe epidemics are usually associated with widespread hail because you get that grain knocked out of the head, and then you get water for the seed to germinate."

In Montana, it was the perfect storm and created a friendly habitat for the wheat curl mite; the vector that spreads the diseases. During those two years, Burrows saw many crops were devastated with two or more of the viruses. "When you have joint infections, you have increased symptom severity and yield loss," she said.

Wheat curl mites reproduce rapidly and are about the size of a speck of dust. They nestle up inside the foliage of a plant, causing the plant to curl around the mite. Evident by the yellow or green streaks on the leaves, the virus can overtake a crop quickly. The mites have lightweight bodies, making them very efficient at traveling in the wind; which is how they move on to greener pastures. When they determine a habitat is no longer suitable, they climb to the top of the stalk and wait to be whisked away.

When Montana experienced a drought in 2017, the diseases declined dramatically within the state. "The spread is very reduced because the mite can't survive those dry conditions," explained Burrows. "(The wheat curl mite) is very highly dependent on temperature and relative humidity for its survival and spread."

Although climate conditions are uncontrollable, poor management practices can cause the viruses to stay alive. When some growers in Montana used hail-damaged crops as a grazing opportunity, the leftover green plant material enabled the mites to survive. "Grazing is a great way to keep wheat streak going, especially if you're grazing cows," said Burrows.

Dr. Mary Burrows speaking at Farming Smarter Cypress conference Oct. 2017 in Medicine Hat.
PHOTO: MORTON MOLYNEUX

Currently no insecticides prove completely effective at killing wheat curl mites. Burrows said using insecticides could cause more harm than good. "The other problem with this is that it's going to kill all of your thrips and thrips eat wheat curl mites."

"If you can keep (the mites) on stressed plants and keep the mite numbers low, that is often an option." Burrows said the key is to starve them by decreasing the inputs on the affected area of your field. "The mite reproduces faster on healthy plants," said Burrows. "If you know you have the virus on the edge of the field, try to avoid fertilizing that part of the field to try to prevent the spread."

In greenhouse trials, Burrows had success protecting crops from the viruses. "The one thing that does seem to work is preventative applications of sulfur," she said.

If management practices are out of the question and a crop has reached the point of no return, termination is the next step. Burrows stressed the importance of doing it correctly, to avoid transmission to a neigbouring field. "I call this a community disease, because it needs everybody in the community working together," she said.

"Mites survive about one week on glyphosate treated plots," said Burrows. During this time they are able to move to the top of the plant, allowing them to be carried downwind to a new food source. Paraquat will kill the plants faster, but it is not a systemic product, so it must be combined with glyphosate to kill the plants, "but it will get rid of the mites faster," said Burrows. Spraying during hot and dry weather is preferred. "It's much less likely that they'll spread and survive," said Burrows.

Spring wheat is extremely susceptible to the wheat streak viruses, often resulting in substantial yield loss. Avoiding the green bridge is crucial to protect your crop, and neighbouring crops. Elimination of volunteer wheat and careful consideration of planting dates can help control the disease.

The wheat stem sawfly is another potential cause of concern for the spread of wheat streak. Burrows and her team are researching to what extent the sawfly assists the virus since they leave grain on the ground. "Sawfly cuts heads near harvest and so we're thinking that's a source of inoculum — a source of the green bridge," she said.

While wheat streak strains have not yet impacted the prairies as severely as Montana, the virus was confirmed in crops throughout southern Alberta last year. If the perfect storm were to hit the prairies, proper management would be essential in reducing the severity of the disease and preventing widespread yield loss.

Discover and learn: Providing information and inspiration to the community

BY OLDMAN WATERSHED COUNCIL

Oldman Watershed Council (OWC) is particularly proud of its Historical Timelines, with over 500 entries of text, maps and photos, ranging from 60,000 BCE through to present day. Alberta Historical Resources Foundation, partly funded the project and attempts to help citizens and policy-makers at every level better understand how decisions and events in our past continue to impact contemporary watershed management and health.

Running in parallel to the timelines are an impressive series of maps that depict land use from traditional Blackfoot land use practices through to projections for the year 2060, based on a 'business-as-usual' model. The map series sparked great interest in the community and OWC received a number of presentation requests.

OWC also created several videos this year in collaboration with community partners. The videos address three core demographics: scientists, the general public, and children/parents/educators. OWC Collaborative Partnerships make this possible. They provide some of the funding and a best-practice example that OWC uses to showcase watershed work in southern Alberta. The City of Lethbridge suite looks at water and wastewater treatment innovation, every day water consumption and habits, and tips and tricks to improve stormwater and urban watershed health.

The Potato Growers of Alberta collaborative videos showcase rural watershed health. These videos cover what it is like to create agricultural abundance in a semi-arid climate, how snowpack in our headwaters contributes to crop success, and what consumers need to know about water and soil management in Alberta potato production.

OWC and the County of Lethbridge plan to develop three more videos that will showcase important aspects of watershed management in southern Alberta.

OWC Education Manager, Sofie Forsström, at one of the many outreach events over the summer.

TAKING ACTION: VOLUNTEER, DONATE, MAKE A CHANGE

OWC tries to inspire the public to learn and to take action. In fact, Moving From Talk to Action was one of the main themes at OWC in 2017. Based on an OWC talk at the University of Lethbridge to the 'Global Citizenship Cohort,' a team of seven students started their own Adopt-A-River project and chose a location near Taber, Alta. They learned about water and soil testing and used the project as a platform to inspire others and set examples. In fact, one of the participants earned a Triple Crown: Not only did he volunteer, but he donated (twice) and became the youngest-serving Board Member!

A Grade 3 student liaises with one of her team at an activity during the #SAWC17 Closing Ceremony.

In 2017, based on United Nations legislation from 2010 that declared clean water a human right; the Canadian federal government's Water Act of 1985; and Alberta's Water For Life Strategy in 2003, OWC sought to produce a document that would inspire municipalities, counties, businesses, communities and families to move from talk to action and pledge to undertake a project for the betterment of watershed management and health. The challenge opened May long weekend with a signing ceremony at Lethbridge City Hall opened by traditional song and drumming composed especially for the event by the North Blood Drummerz. Minister of Environment and Parks Shannon Phillips presented OWC awards at the Closing Ceremony in November.

RESEARCH AND PROJECTS: HEADWATERS, TAILWATERS... AND EVERYTHING IN BETWEEN

The OWC Engaging Recreationists Program went from a tentative pilot project to gaining attention as a model for action throughout Canada. Reducing threats to the headwaters is Goal 3 of OWC's Integrated Watershed Management Plan (IWMP). The program engages backcountry users to restore places where Albertans recreate, changing behavior to reduce impacts and become stewards.

On farms and ranches, OWC ran a 3-part community engagement series Voices of the Oldman: Agriculture Matters that invited landowners, producers and agricultural groups throughout the watershed re-envision our Watershed Legacy Program (WLP). The Oldman watershed includes some of the most productive farm and ranchland in the world. The OWC is proud of its reputation as a hands-on organization and works on the land directly with rural stakeholders.

OWC advises the Minister of Environment and Parks on headwater issues and provides information and recommendations to Government of Alberta staff lead the establishment of the South Saskatchewan Biodiversity Management Framework, Livingstone and Porcupine Hills Linear Footprint Management Plan and Recreation Management Plans and Castle Park Management Plan.

For more information, visit oldmanwatershed.ca.

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Wheat Stalk	**July 19** Lethbridge Site 8:30 am – 3 pm
Open Farm Days	**August 18** Lethbridge Site 11 am – 4 pm
Lethbridge Conference	**December 12 – 13** Lethbridge Exhibition Park Full conference 1-day

watch for details on
www.farmingsmarter.com

2017 Alberta Weed Survey

BY CHARLES GEDDES, AAFC RESEARCH SCIENTIST – WEED ECOLOGY AND CROPPING SYSTEMS

Julia Leeson, a Weed Monitoring Biologist with Agriculture and Agri-Food Canada, led a team that worked hard this year surveying weed species in Alberta field crops. Generally, the provincial weed survey takes place in July and August, following in-crop weed management, once every decade since the 1970's.

This year, the survey sampled 1,236 Alberta fields (**Figure 1**) with the collaboration of Linda Hall (University of Alberta) and Chris Neeser (Alberta Agriculture and Forestry). The crops sampled were canola, spring wheat, durum, barley, oat, lentil and field pea.

Each weed species found was summarized using a relative abundance index based on the frequency, uniformity, and density in the fields sampled. Then, the relative abundance index ranked the Alberta weed species from the most to least abundant.

The top five most abundant Alberta weed species in 2017 were chickweed (*Stellaria media*), wild buckwheat (*Fallopia convolvulus*), lamb's quarters (*Chenopodium album*), wild oats (*Avena fatua*), and volunteer canola (*Brassica napus*) (**Table 1**). Chickweed was the most abundant weed species in Alberta and occurred at the greatest density (average density of 33 plants m-2) compared with all other weed species.

Wild buckwheat was the second most abundant weed and occurred in fields most frequently (42 per cent of fields), albeit at a much lower density than chickweed (average density four plants m-2). Since the 1970's, false cleavers (*Galium spurium*) increased in relative abundance the most (increased by 35 ranks) out of the top 10 most abundant weed species, followed by volunteer wheat (increased by 22 ranks since the 1980's) and volunteer canola (increased by eight ranks).

Frequency — per cent of fields where the weed species occurred

Uniformity — per cent of quadrats where the weed species occurred in the field

Density — average number of plants per metre square of the weed species in the fields where the weed was present

There could be many reasons for shifts in abundance of weed species in Alberta in the past four to five decades. Some of these reasons include shifts in predominant tillage systems from conventional to minimum or zero-tillage, selection for herbicide resistance in weed species, the release of herbicide-resistant crops, an increase in production of pulse crops with few POST-emergence herbicide options, and potentially also changes in climate and/or weather patterns.

Seven of the top ten most abundant weeds in Alberta (including volunteer wheat and canola) are resistant to at least one herbicide mode of action. Of these, wild oats holds the record for biotypes resistant to the greatest number of herbicide modes of action.

Alberta has triple herbicide-resistant wild oat biotypes (to herbicide Groups 1, 2 and 8, while quintuple herbicide-resistant wild oat biotypes (to herbicide Groups 1, 2, 8, 14 and 15) are in Manitoba. Species-specific biology also can play a large role in the relative abundance of weed species.

Source: Leeson JY, Hall L, Neeser C (2017) Residual weed population shifts in Alberta — 1973 to 2017. Page 43, in: Proceedings of the 71st Canadian Weed Science Society Annual Meeting, Saskatoon, Sask., CA. November 20-23.

Figure 1. Fields surveyed in Alberta in 2017 (red dots) and the extent of agricultural area (shaded gray). Source: Leeson *et al.* (2017)

Table 1. The ten most abundant weeds in Alberta in 2017[a]

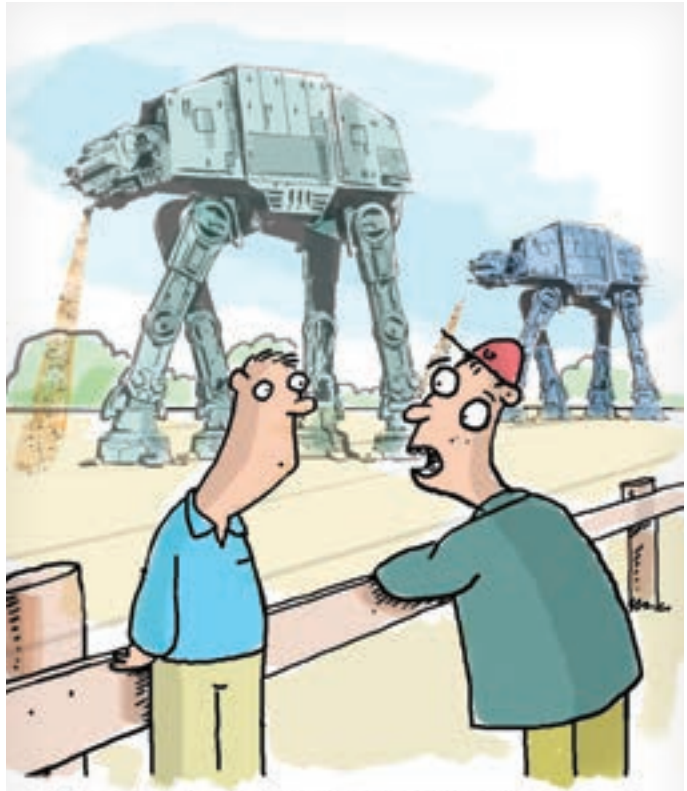
	Relative Abundance Rank					
	1970's	1980's	1997	2001	2010	2017
Chickweed	6	5	2	3	7	1
Wild buckwheat	3	1	3	1	1	2
Lamb's quarters	5	7	7	6	8	3
Wild oats	2	3	1	2	2	4
Volunteer canola	13	19	20	16	6	5
False cleavers	41	28	8	7	5	6
Green foxtail	4	4	17	8	19	7
Volunteer wheat	—[b]	30	22	22	18	8
Canada thistle	9	12	5	4	3	9
Dandelion	15	20	10	10	4	10

[a] Adapted from: Leeson *et al.* (2017)
[b] Volunteer wheat was not surveyed in the 1970's

Farming Smarter supports Southern Region 4-H

Each year at our Lethbridge conference, we hold an auction with proceeds going to support local 4-H programs. In 2017, we raised $8,193 for the clubs.

We also offer our stage to some outstanding young speakers from around southern Alberta. In this photo, Kiara Porteous of Generations for Tomorrow 4-H Club talks about modern technology before an audience of about 200 people.



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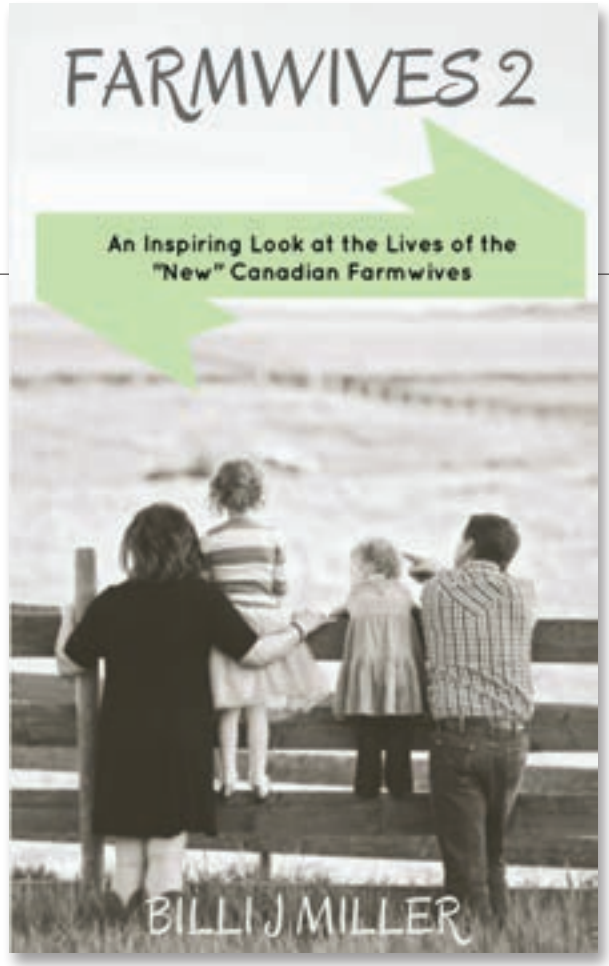
Farmwives 2

Author: Billi J. Miller

REVIEWED BY JENNIFER BLAIR



"She is the one quietly behind the scenes, ensuring everything is operating smoothly."

That just about sums up the day-to-day life of a modern-day farmwife, the focus of Alberta author Billi J. Miller's latest book, *Farmwives 2*.

Told in a series of interviews with 25 farm women from across the country, *Farmwives 2* is a follow-up to Miller's *Farmwives in Profile* that showcased the stories of 'traditional' farmwives from Miller's home-base near Lloydminster, Alberta. In *Farmwives 2*, tradition gets turned on its head as Miller explores what it means to be a farmwife in 2018.

Just as Miller wrote her first book to celebrate the unsung heroes of the family farm, *Farmwives 2* celebrates the changing role of women on the family farm and examines the shifting perception of what a farmwife really is.

For some of the interviewees, 'farmwife' was a title to be embraced, and these women revel in taking care of the brunt of the housework and child rearing, roles that would not be unfamiliar to our more 'traditional' foremothers. Good for them. For others, 'farmwife' didn't quite fit. They see themselves as farmers in their own right, not as an extension of their husband. Good for them too.

But few felt that they were being an admirable farmwife. Some felt they should be doing more around the house; others, more in the field. They all felt they should be doing *more*.

It's an important insight not only into the lives of Canadian farmwives, but also into farming itself. As margins tighten and workloads increase, farmwives — or female farmers, if that title fits better — will continue to play an ever-growing role in Canadian agriculture and the industry will need to adjust in order to support these women.

Miller's new book is a good step in the right direction. In addition to sharing quick-and-easy recipes for the busy season, funny anecdotes from the farm, and practical estate and succession planning tips, the women of *Farmwives 2* also share their fears around farm succession, their insights into marriage, and their hopes and dreams put on hold for the sake of the farm.

It's not an easy life, being married to a farmer, but through her book, Miller gives women permission to just embrace being a 'farmwife' — whatever that means to them.

"I want women to know that it's okay if they are not fulfilled by spending their days childrearing and tending to a garden. It's okay that you feel resentful if one hundred percent of the housework lands on you in your marriage because it's not typical for farm men to help out. I want you to know that it's okay if you want your role as a farmwife to look very different than the one before you."

Equal parts laugh-out-loud funny, poignant, and instructive, *Farmwives 2* shows that, just as there's no right way to be a farmer, there's no right way to be a farmwife.

It's not an easy life, being married to a farmer, but through her book, Miller gives women permission to just embrace being a 'farmwife'

Billi J. Miller

ALPINE®: More than crop nutrition products

ALPINE® has always been committed to serving its customers in many ways in addition to a growing line of liquid crop nutrition products. David Tysdal, Regional Sales Manager for Alberta and B.C., explains that "ALPINE endeavors to provide a one stop shop to growers new to liquid products." Most seeding equipment is set up for handling dry fertilizer products so it can become a daunting task for some growers to convert to liquid in terms of distribution manifolds, pumps, product tanks, and calibration. ALPINE has worked with major suppliers and our own product development team to come up with products specific to individual grower's needs.

Distribution systems

ALPINE offers two types of manifold systems to accurately deliver product into the seed furrow. The ALPINE Block manifold system was developed in house and is a robust compact system utilizing TeeJet® components. "Growers are drawn to it by its durability and ease of installation" says David. The Wilger® system manifold is also distributed by ALPINE and offers a quick visual evaluation of product flow. Both systems are fully supported by the ALPINE sales team. ALPINE has introduced a new electric pump which has a higher capacity than previous models and works well with either manifold system. The new pump is especially well suited for air drills over sixty feet. Both manifold systems can be integrated with the ALPINE Injection System for easy injection of inoculants or micronutrients. Assistance in selection of the appropriate system is a service provided by the local ALPINE District Sales Manager. All new ALPINE customers are eligible for a $2000 rebate when they purchase their ALPINE distribution system.

Product application tanks

While a few manufactures do offer factory liquid tanks on the commodity cart most growers will need to add an application tank to their air drill system. Growers normally choose between: tool bar mounted, tractor mounted, commodity cart mounted or caddy units. Again the ALPINE DSM can assist in determining the best tank location for any particular situation and preference that a grower may present. ALPINE now stocks new tractor saddle mounts and tanks for most popular brands of four wheel drive and quad track tractors. David states that "the reception to both of these new services have been well received by the growers as it takes one more task off their to do list."

Information manual

Once a grower has all the pieces to convert to liquid the ALPINE DSM is there to finish off the project with experience gained from numerous installations. Each new application kit comes with an information manual covering manifold installation instructions, electric diagrams for pump installation, calibration procedures and system maintenance. It also covers the basics of the do's and don'ts of handling and storage of ALPINE liquid products.

Get the ALPINE® team and the Phazed Nutrition Program® working for you: 1-844-655-PHOS (7467)

RAWEST IN

285 Service Road
Vulcan, AB
403-485-1998
1-888-972-9378
info@rawest.com

Robert Suitor, ALPINE® DSM
403-363-8555
Taylor Groenenboom, ALPINE® DSM
403-585-3997
www.alpinepfl.com

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WELCOME BACK AUTUMN!

Autumn Barnes, Canola Council of Agronomy Specialist for Southern Alberta is back from parental leave and ready to help growers and agronomists get answers for all their canola growing questions.

You can reach Autumn at 403-360-0206

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