

FARMING SMARTER

Spring 2024 Edition



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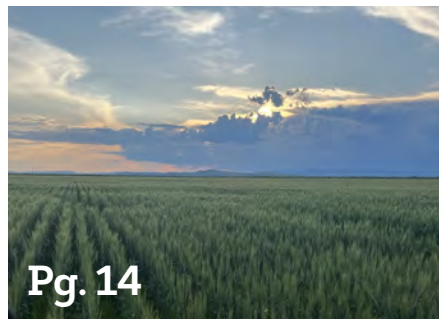


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Editor: C. Lacombe



COVER PHOTO:
Rachelle Phillips counts plants for the field scale manure management in corn study funded by Complete Agronomic Services

PHOTO: GEORGE LUBBERTS

Manage farm rotations rather than chasing the markets



Farming Smarter consistently demonstrates to and discusses with growers the value of crop rotation, which supports integrated pest management. On my operation, if I stick to a rotation and do what makes the most sense agronomically, it pays off economically.

I don't chase a hot market I'm never going to hit as it is short term thinking. The market vagaries have too many factors that influence commodity prices. Growers need to think about the long-term health of our operations — agronomic, economic and generational.

Good agronomic practices build your soil health over decades. It may feel counter-productive in the short term, but it pays off in the end.

We've been building organic matter for the last 30 years. Every year, it increased with the use of stripper headers, no till and crop rotation. Soil health and organic matter are the general farm performance

report card. If you look after your soil, the yield will come.

I urge you to think multigenerational. I think the most successful farms are the ones that plan long term. Sure, you need an immediate plan for what you're doing this year, but you also need to think how your descendants will benefit from your soil stewardship.

Focus on crop rotation, special crops, and novel crops. Economically, that is the best in the end. Profitability will come when you look after your soil and while pesticides are important, there are other tools in the toolbox. You can rotate crops, vary seeding times and incorporate fall seeded crops. If you irrigate, you can try double cropping systems, cover cropping systems and intercropping to manage pests.

Farming Smarter takes a lot of risk out of these systems through its small plot and field scale research. I advise you to check up on its work often and follow the project

reports of studies that help you create a system for your farm.

Take a few minutes to browse its website — especially the projects section. You will see the diversity of projects the team has on the go and has done over the past decade. The staff members have a wealth of information and love to answer questions from farmers.

I'm not saying success happens overnight or that you need to change your whole farm. Experiment with intercropping on smaller acreages in different scenarios - seeding rates, seeding dates, and different crops. Find the formula that sustains your farm for the generations to come.

Ryan Mercer
Farming Smarter board president

Executive Director Report

Waiting for take off



Imagine we finally boarded the plane but the tower delayed take off. We sit in the plane in thick fog waiting to be de-iced. The entertainment screen won't work, it's starting to get hot and the fan blows warm air. We want to blame it on weather but there's more to it. The whole Canadian agriculture industry resembles sitting on the tarmac wondering what's next.

The default discussion point is the weather — drought, drought and more drought. Will get enough moisture this season? Will irrigation reservoirs fill and when can we start seeding? All fun stuff to talk about but unpredictable. Oldtimers know not to worry too much and will go about business as usual. However, we're securely in a dry cycle and the economic pressures are poignant for farmers and government assurance programs.

Improved cropping systems, insurance and risk management strategies kept

things afloat where failures might occur. High crop prices helped but higher input costs countered. Then prices dropped and the looming drought has farmers carefully planning and tweaking up to the last minute. Drought provides some tough lessons where every mistake gets amplified.

Good agronomy is paramount and wise use of resources changes profit and loss potentials. Weed control is more important than ever if drought persists and we learn how important a competitive crop is when we don't have one.

We all need to take note of a dwindling agriculture innovation system that brought farm resilience to where it is today. Governments seem to focus on mitigating greenhouse gas emissions which doesn't necessarily help with adaptation. Innovation focuses on small and medium sized businesses with a technology focus and a lack of agricultural understanding. Agri-

culture and Agri-Food Canada's research creeps away from field-based research while colleges and universities struggle with budgets and attracting students. The system lacks sufficient public support and expects industry to pick up the slack. It's a competitive and fragmented environment that impedes collaboration.

If we want this heavy plane to get off the runway, we need to add more fuel and chart a better flight plan. When the fog lifts, we need to be ready to deal with some turbulence and arrive at a great destination. Prepare for takeoff and enjoy your flight!

Ken Coles
Farming Smarter Executive Director



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John Kolk, inspirational leader in conservation agriculture and advocacy

BY KRISTI COX

Commitment to conservation agriculture and a willingness to share knowledge and support others are the key attributes of the farmers and scientists who receive the Orville Yanke Award. John Kolk, 2024 recipient, has an abundance of all those qualities.

“John has always been a farmer who is obviously interested in sustainability,” Ken Coles, General Manager at Farming Smarter explained. “He’s helped with research projects, and he’s an early adopter of new practices. If there’s a conservation angle, he’s involved, whether it’s research, policy, or extension.”

Kolk farms with his family near Picture Butte, Alberta, and credits a foundation of stewardship ethics for his decisions around business and personal practices.

“If you’ve got resources, you’re responsible for that,” said Kolk. “You take care of them, and preferably leave them in better shape than you receive them. Whether it’s raising crops or raising livestock, it’s about understanding the local biology, climate and production practices and trying to move towards using less energy, less resources and still maintaining or expanding your production.”

One area where Kolk has seen great success is in water management. When his grandfather was starting to irrigate, 36 inches of water produced 50 bushels of barley. Today the land produces 140 bushels with approximately 16 inches of water. He uses variable rate irrigation and has experimented with subsurface drip irrigation.

“We’re trying to use technology to farm by the by the square foot instead of by the acre,” said Kolk.

Other conservation measures used on farm include strip tillage, cover crops, and manure application. These combined efforts have resulted in organic matter increasing from 1.5 per cent to 2.5 per cent in the past 10 years.

“He’s definitely innovative,” said award presenter, George Lubberts, owner of Complete Agronomic Services. “There are times you try things, and it doesn’t always work out, or you have to do it two or three or four times to make it work right. He’s willing to stick to these things where he feels that there’s an advantage to conserving the soil, and to maximize the amount of carbon that’s captured.”

Kolk’s commitment to agriculture reaches far beyond his fields. Sometimes challenges come in the form of consumer confidence or government policies.

“You’ve got to make sure that the agricultural message gets to the decision makers,” said Kolk. “You have to do it right on the farm, but you also have to push to get it done right at the legislative level.”

This led to Kolk serving on boards, including Farming Smarter’s. When asked to list his other boards, Kolk said there are many, but listed how three exemplify his commitment to conservation agriculture.

Bow River Irrigation District: “There we work on areas like water delivery and water efficiency tools that allow farmers to do a better job and still meet our legislative requirements.”

Alberta Pulse Growers: “Pulses are an important part of the rotation if we’re trying to move crop agriculture toward net zero.



John Kolk, left, receives the Orville Yanke award from George Lubberts, right, at the Farming Smarter conference Feb. 14, 2024.

PHOTO: FARMING SMARTER

They reduce nitrogen usage the year they’re planted and into the next year. They’re a low-cost, water-efficient, carbon-sequestering, energy efficient protein option for food consumers.”

Alberta Biodiversity Monitoring Institute: “ABMI monitors the entire province looking at changes to plants, animals. We work with forestry industry, oil and gas industry and municipalities. We provide the data that managers and regulators work with to show a baseline as well as changes over time.”

Kolk sees great opportunities in agriculture as well as its challenges. The need for profit is a good thing but can be an obstacle to growth.

“Farming is very, very competitive,” explained Lubberts. “If you have a competitive edge, sometimes you don’t want to talk about it because you don’t want to lose that edge. With John that doesn’t seem to be an issue. He’s more than happy to talk to other people and help them to do things the right way.”

Kolk’s dedication to conservation agriculture, improving his practices, problems solving and sharing his expertise has earned the respect of his peers.

“He’s somebody that I would consider a mentor,” said Ken Coles, manager of Farming Smarter. “Both in providing advice, but also challenging me when I need it. I’ve always appreciated that about him.”

He’s contributed much already and intends to continue to grow.

“Agriculture’s got great opportunities,” said Kolk. “It’s a great place to be. We have to keep working to be better at what we’re doing. You want to do the right thing, in the right way for the right reasons. All three of those pieces are important. I think work in conservation agriculture is doing the right things for the right reasons.” **FS**

Gurbir takes a step forward

BY LISA KOPOCHINSKI



Talk to anyone at Farming Smarter and they will tell you they are going to miss Gurbir Dhillon.

Gurbir who joined the team April 2020 as Research Scientist — took a new position as Prairie Agriculture Program Manager with Nature United in Winnipeg, Manitoba.

To acknowledge the work Gurbir accomplished the team wants to highlight who he is and what he achieved while with them.

“Gurbir was an integral part of the Farming Smarter team,” says Ken Coles Farming Smarter Executive Director.

“His gentle, patient, and studious approach resulted in tremendous impact through thoughtful and scientifically sound projects, reports and publications. He elevated Farming Smarter with industry, farmers and within the scientific community. We will miss him dearly.”

THE BEGINNING

Let’s go back and find out what attracted him to agriculture and why he chose this as a career path.

Gurbir has a strong and long held interest in improving soil health and environmental services of agro-ecosystems. He completed his M.Sc. in Soil Science from the University of Delaware in the U.S. where he studied soil carbon exports in runoff water during storm events.

At the University of Saskatchewan, he studied soil organic matter dynamics and sequestration using synchrotron-based spectroscopic techniques in his postdoctoral and Ph.D. programs.

“I have always been attracted to food production and the fundamental role it plays in sustaining life,” he says. “Being part of an industry that directly changes people’s well-being, and the global economy is incredibly fulfilling. It is a dynamic industry that constantly evolves in response to food production needs and sustainable goals. The need for innovation and adaptation appeals to me as a researcher.”

At Farming Smarter, he led the Agronomy Program focused on grant-funded small plot research.

“My responsibilities included developing research projects based on industry needs, acquiring grant funding through research proposals to provincial and federal funding agencies, developing field protocols, managing project-related timelines and deliverables as outlined in the funding contracts, data analysis and reporting. I worked closely with the team to execute these responsibilities.”

CAREER HIGHLIGHTS

Gurbir says his time in southern Alberta was an incredibly rewarding experience and adds that one of the standout highlights was the exceptional work environment and strong team spirit among the staff.

“Team members actively support one another — whether we tackled multiple projects during the summer season time-crunch or figured out innovative research solutions at a brainstorming meeting. Even simply sharing stories over the lunch break, the team spirit at Farming Smarter creates an environment where everyone feels valued and motivated.”

He says another highlight was the direct involvement with the agricultural community.

“We have close ties and direct involvement with local farmers, agronomists, and industry experts that offers a unique oppor-

tunity to engage at the ground level with the community we aim to serve. This allows us to better understand challenges faced in the fields ensuring that our work is relevant and genuinely impactful.”

Gurbir considers Farming Smarter a good step in his career path.

“This opportunity allowed me to bridge the gap between research and real-world problem-solving of the complexities faced by farmers. Direct interaction with the agricultural industry was instrumental in expanding my knowledge base and provided direct experience that directly applies to the challenges in the field.

He adds that the connections he built with colleagues, local farmers and industry experts enriched his understanding, “but also provided opportunities for potential collaborations and partnerships that will undoubtedly be valuable in the future.” **FS**

“Being part of an industry that directly impacts people’s well-being, and the global economy is incredibly fulfilling.”



Field School participants listen as Gurbir Dhillon presents early research results from the Saving Soils program. PHOTO: FARMING SMARTER

Drought: A southern Alberta perspective

BY C. LACOMBE

Drought is a regular occurrence in semi-arid southern Alberta. People that live in the Palliser Triangle expect droughts, recognize they can happen in any year, and research/study ways to survive them.

“Farming Smarter is always looking at ways we can farm better with a large focus on moisture conservation,” says Ryan Mercer, owner of Mercer Seeds Ltd. in Lethbridge County.

Even before people moved to the prairies, John Palliser foretold of the drought hardships people living here would experience. A more optimistic John Macoun convinced governments the land would produce and pioneers followed the railroad out across the prairie.

If you talk to a fourth-generation farmer south of Hwy. 1 in Alberta, they will tell you drought is a guiding factor in cropping systems every year. There is still far more dryland farming in southern Alberta than there is irrigated land. In fact, most farms that have irrigation also dryland farm.

“We’re 90 per cent dryland and grow peas and lentils for pulses. For cereals, we’ve got durum, spring wheat, winter wheat, barley, and oats. For oil seeds, we’ve got mustard, flax and camelina,” says Mercer, who farms 7,500 acres.

“We’ve learned a lot and we’ve had a lot of dry years in the 80s and 2000s but we’re farming differently than we did back then. And we learn as we go.”

In 2017, to celebrate Canada’s 150th birthday, Farming Smarter Association dedicated its Field School to historic farming



A Prairie Tractor Museum volunteer tills the soil like it’s 1950. PHOTO: FARMING SMARTER

practices and change in southern Alberta. The past tillage practices demonstration from the days before conservation tillage elicited real horror on the faces of onlookers as the Prairie Tractor & Engine Museum Society volunteers aggressively tilled a sacrificial slice of a Farming Smarter field.

“Most of the dryland now is no-till. We leave taller stubble and disturb less during seeding. Thanks to Brian Beres’ work with ultra early seeding, we’re seeding earlier and earlier,” explains Mercer. Seeding earlier allows crops to take advantage of winter moisture and early spring precipitation. Dr. Brian Beres is a Senior Research Scientist — Agronomy with Agriculture and Agri-Food Canada in Lethbridge.

Mercer says, “As farmers, we have to stay optimistic, hope for the best and plan for the worst.” In his opinion, planning for the worst means having a long-term crop rotation and taking care of the soil. He firmly believes that reacting to the vagaries of weather or markets is a losing proposition.

“If you get more rain than is forecast then your crop will do well and you will have a bumper crop year,” he says. Mercer tests his nitrogen levels in the spring to check for carry over and tops up the soil nitrogen.

“Fertilizer rates are based off your soil tests, so you can fertilize accordingly. That is difficult but we generally target higher yields,” he says. The dry climate means less nutrient leaching and more carry over in southern Alberta.

“The crops that we grow will still produce okay in a dry situation. We had two inches of rain last year in crop and we still averaged 35 bushels of peas, durum and spring wheat. We generally stick to that same crop rotation even in a drought situation.”

Further east at Bow Island, Will Van Roessel, owner of Specialty Seeds Ltd. farms about 14 quarters of land where he grows hybrid canola for seed, hemp, spring wheat, durum, yellow peas, winter wheat and hybrid fall rye.

While neither Mercer nor Van Roessel are worried about next growing season yet, Van Roessel also has his contingency plan if the precipitation doesn’t come. Some



Gary Vucurevich shares the results of his experiment planting sugar beets directly into the stubble of last year’s barley crop. No-till can be tricky with beets as they like soft soil. His presentation was part of the Farming Smarter 2023 Rolling Innovation Tour that took a bus load of farmers to visit on-farm innovations.

PHOTO: FARMING SMARTER

crops survive better even with less moisture. What people plant this year may be different than other years according to Van Roessel. Every crop has its water needs to produce a profitable yield. However, pulse crops require less water than corn or potatoes for example.

“Some people might be thinking of planting some peas or even lentils. Lentils can probably get by with even less water than peas.”

Also, as the season progresses, he will monitor the commodity prices and put his water where the money is, so to speak.

“I’m least likely to take water away from my seed canola crop because that’s a high returning crop. If I’m going to take water from my cereal crop, I’m more likely to take water from wheat than durum,” says Van Roessel.

Every farmer in the region will watch the moisture situation updates coming from Alberta Agriculture and irrigators will check notices from the district that serves them. They have until April or May to make planting decisions.

“I haven’t had any irrigator come to me and say, ‘so we’re getting a full allocation.’ They all they want to know how bad it might be,” says David Westwood, St. Mary River Irrigation District (SMRID) General Manager.

“The further south you go, it’s just historically drier. This is not unprecedented. We don’t go decades without having water issues,” Westwood says.

That said, he admits that, as of late January, this is a year for the records. The last time it was this dry was in the early 2000s, but it's not the same. He thinks the reservoirs had less water but the snow pillows were better.

"It's too early to get too concerned because historically we don't receive the majority of our snowpack until March, April, and into May."

This is not to make light of the situation. Westwood and Jose Sanchez, Lethbridge Director of Infrastructure Services, both have many people and businesses that rely on them for water supply. SMRID delivers water to small municipalities, such as Winnifred, and food processors such as Lantic Sugar in Taber and Lamb Weston in Purple Springs. Sanchez has Hostess-Frito Lay, Cavendish and McCain on his supply lines and surrounding small municipalities.

"We are concerned about the circumstances, but that's why we have different plans, activities and ideas in the works," Sanchez says. "It's that work with different stakeholders to make sure everybody's on the same page and to share the same communications." He has internal and external groups in discussions on this event.

Lethbridge has a Water Rationing Plan passed in 2016, but growth in the city means it's time to revisit it. In 2016, the plan focused on residential use, but Sanchez says it's time to consider what industrial users can do too. City Council will consider economic incentives for both residential and industrial users.

"Whatever we do, we need to separate this from the drought conditions. We know we may get a really good spring and a lot of rain, but next year we might be back at the same place we're at right now. We need to start planning for this and getting all the tools on the table so we're ready for what we need to do." FS



Mike Gretzinger, Farming Smarter Research Manager, planting wheat February 13, 2023, as part of Dr. Brian Beres ultra early seeding re-search. The research shows that using soil temperature rather than dates to time seeding can offer crops that yield well, resist pests and mature in time for an early harvest. Most agriculture research in southern Alberta takes drought into consideration through research in soil moisture retention, integrated pest management, and crop varieties and rotations. PHOTO: FARMING SMARTER

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Ryan Barrett of PEI Potato Board speaks at the February Farming Smarter conference. PHOTO: FARMING SMARTER

PEI cover crops boost soil health on potato farms

BY TIM PARENT

Prince Edward Island is well-known for its potato production. The maritime province is home to more than 100 varieties of potatoes thanks to its iron-rich soil and optimal climate.

Protecting the soil is a priority for the PEI Potato Board. In a rain-fed system with coarse-textured, erodible soils, ensuring optimal soil health and improving soil organic matter is vital to the province's current and future potato production.

USING COVER CROPS TO IMPROVE SOIL HEALTH

For the last five years, Ryan Barrett, Research and Agronomy Specialist with the PEI Board searched for ways to improve soil health through cover crop implementation. He worked on grower-directed and grower-involved trials around using fall-season and full-season cover crops in potato rotations and shared the data with growers across the country.



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Speaking at the February Farming Smarter conference in Lethbridge, Barrett says the top priority for this cover crop research initiative was keeping soil in the field.

“For cover crops, my number one objective is to prevent wind and water erosion,” says Barrett. “We tried different establishment methods, different crops, different species, and different timings to maximize the amount of cover to keep the ground covered,” says Barrett.

Additionally, the research measured cover crop effects on soil pathogens, soil health and organic matter, nitrogen carry-over, nitrogen synchronization, and other metrics to determine the benefits and detriments.

CHOOSING THE RIGHT COVER CROP

When choosing which cover crops to experiment with, Barrett had a variety to choose from, while considering several scenarios.

“For the covers before potatoes, most of those are planted in August and early September. So, people have a lot more options. We’re using brassica crops like mustard or radish. We’re using spring cereals and winter serials or mixes of some of those things,” he says.

“In the covers after potatoes, you’re a little more restricted to spring cereals for the early-harvested acres and fall cereals for the late-harvested acres. So, the choices are more restricted, but those covers are also a little cheaper. Even with fall rye or winter wheat, if you’re not worried about taking it to crop next year, growers can just broadcast it on ahead of potato harvest, and the harvester does the incorporation. It’s a cheap and inexpensive way to get a cover crop established.”

NO ONE SIZE FITS ALL APPROACH WITH COVER CROPS

Barrett says they saw a net benefit for growers, at least in Prince Edward Island.

“In Prince Edward Island, we saw yield bumps from the use of fall covers ahead of potatoes, compared to no cover crop,” he says. “And we saw covers after potatoes, decrease nitrate-leeching and erosion with improvements in keeping the soil in the field and hopefully, making that whole system a bit more sustainable.”

Additionally, Barrett says they saw an increase in cover crop adoption by growers, underpinned by the research.

However, he points out that there’s no one-size-fits-all approach with cover crop implementation.

“It all depends on where you’re at in your rotation. What may work in PEI may be different than what works in Alberta. There’s no one recipe or one situation that works for everybody.”

LOOKING AHEAD

The research into the effectiveness of cover crops continues with additional focus on nitrogen leeching, the effect of rotational grazing on soil health, and the cumulative effect of cover cropping and reduced tillage on soil organic matter.

With potato growers increasingly embracing cover crop techniques, it paves the way for a more resilient and sustainable potato production landscape and safeguards the foundation of PEI’s iconic potato industry. **FS**



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Join the Farm Resiliency & Mentorship program

BY TIM PARENT

Southern Alberta farmers will want to meet Ashley Wagenaar, Farming Smarter conservation agronomist. She is passionate about three things: science, agriculture, and, most importantly, sustainable food production. She has some funding to work closely with 10 farmers/producers to get the most out of the land and soil.

She holds a University of Lethbridge BSc in Biology and spent the last decade in the vegetable processing sector in Alberta and Ontario. She advocates for creating healthy and sustainable food production for all.

Her experience in the food production industry led her to Farming Smarter. She will head up the collaboration effort with Farm Resilience Membership program to explore local and regional farming practices, specifically nitrogen management

and cover crops. Wagenaar will explore both topics in various regions of southern Alberta, looking for areas of improvement and developing strategies that build farm resilience while maintaining the success of soil health and cropping systems.

“People are always trying to adapt published information and research into local, regional, and specific farm strategies. This program is the opposite. I come to a farm and look at your specific strategy and help you decide if this is the best practice or if there are minor changes to improve,” says Wagenaar.

She will present the initiative to farmers and clients looking at implementing new and best management practices for nitrogen and cover crops. She wants to work with farmers exploring new strategies or practices. The goal is to improve



Ashley Wagenaar, Farming Smarter Conservation Agronomist PHOTO: FARMING SMARTER

what they already do or something brand new to them that needs support.

“It’s a really interesting project because it’s very open-ended and flexible. I don’t have any strict guidelines. Whether irrigated or dryland, I invite farmers to examine crops you grow, if you use cover crops, or how you use your nitrogen. Anybody can approach me with a project.”

Wagenaar will work alongside a mentor. Jamie Puchinger Farming Smarter assistant manager says they wanted to take a big step towards getting farm sup-

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port to those interested in research on their farms or eager to implement best management practices. She believes they can achieve that goal by hiring Wagenaar and teaming her up with Rob Dunn, a former provincial government agronomist and now an agronomy consultant.

“We knew Rob focused much of his career on conservation agronomy. He was heavily involved in many big practice changes, so we wanted him involved with this new person to provide direction and mentorship.”

When it comes to mentoring, Puchinger says agriculture isn't overly unique to the concept but stresses the incredible value of having a mentor.

“Everybody needs to learn from somebody. You find a few people here and there, create an inner network of people you trust, and have a sounding board to throw out ideas and get feedback. Having that sounding board is great. You can bounce ideas off someone and work through that dialogue to get a little further than you may have on your own.”

This initiative is still in the design phase. Exactly what research project or best management implementation hinges on the farms involved. Wagenaar is on the hunt for a diverse range of farmers.

“I'd love to hear from farms on any ideas that fall under our guidelines of nitrogen management or cover cropping. These can be, for example, part of an agronomy plan for a new crop a grower is planning to try, or a way to reduce a broadcast fertilizer application, or how to establish a fall cover with limited moisture, or anything along these lines” says Wagenaar.

To participate in the project, contact Wagenaar through Farming Smarter.com or 403-317-0022. **FS**



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Mongolian agriculture has unique challenges

BY KRISTI COX

Wheat crop on Chadraabal farm. PHOTO: BADRUUN CHALRAABAL

There are similarities in the challenges farmers face around the world, but they're layered with unique factors in each region. Recently, Badruun Chadraabal, a Mongolian agronomist trained in Canada, spoke at Farming Smarter's virtual Global Crop Production Conference. He shared the journey to his career, his visions for Mongolian agricultural landscape modernization, and the Smart Agriculture Initiative that makes critical agronomic information more accessible.

In 2007, Badruun's father purchased a farm. He had no farming background but wanted to try a different type of business. They did their best with older technology.

"The techniques were traditional. We tilled the land with old Soviet equipment that wasn't reliable," explained Badruun.

Later, a consultant from Canada came to Mongolia and worked with farmers on ways to move toward no-till and increasing fertilizer to replenish nutrients in the depleted soils. He also facilitated import of used Canadian farm machinery.

This consultant inspired Badruun to pursue studies in agriculture, and he enrolled at the University of Saskatchewan. He completed his degree and worked in Canada, gaining experience. When he returned to Mongolia, he was enthusiastic to advance agricultural practices there.

Some of the challenges in Mongolian

agriculture are like those faced in Canada, while others are significantly different.

Climate change has a significant impact in Mongolia. Badruun explained that in the past six years temperatures have increased by about 2.3C and extreme hot summer days have increased, causing stress to crops. Additionally, precipitation increased, but it falls mostly in winter or occurs as extreme weather events, causing flooding.

Many Mongolian farmers don't have the resources and knowledge needed to implement the critical soil and water conservation practices needed to cope with these changes.



Badruun Chadraabal oriental mustard crop
PHOTO: BADRUUN CHALRAABAL

A unique challenge in Mongolia is the effects of nomadic herding. There are 300,000 nomadic herders in Mongolia.

"The cultural aspect of livestock is ingrained in our culture," said Badruun. "We've been doing this for over 2000 years."

Quotas controlled this traditional practice in communist times until Mongolia transitioned to democracy. The newfound freedom resulted in increased density of livestock. Now overgrazing is a significant challenge on both wild lands and on crop land. Mongolia needs a solution to ensure long term sustainability of the land.

"I think we can find a symbiotic system where we can work together and mutually benefit each other," said Badruun, referring to his observations of Canadian farmers letting livestock winter on their fields. In return, the livestock waste replenishes the fields.

No-till is a key component of soil and water conservation, but the current market for Mongolian farmers encourages a wheat and oil seed rotation. They need a more diverse rotation. Change is difficult when many older farmers have done things the same way for decades.

"Younger farmers are more accepting of change, and I'm seeing more of them at meetings now," said Badruun. But sometimes those gatherings where farmers meet to discuss problems and prepare for the next season have presentations from

older agronomists who share outdated advice. Ensuring the up-and-coming generation of farmers gets current education would be beneficial but has its own barriers.

“It’s not cheap to go to Canada and study,” said Badruun. “People who do have the finances for it will go off and study business or something.”

Badruun sees larger companies establishing feedlots as a solution for this. They want expertise and may send young people to obtain needed training.

No-till practices might become more common as well. With feedlots, there will be need for alfalfa or field peas, and adding them to rotations will increase the opportunity to reduce tillage.

Badruun is optimistic.

“I think we just need time,” he says. “If we have enough time, we could roll back the damage that we did to the environment. If big companies enter this industry, they provide incentive for more people to get into the industry. The bigger the company, the more research they will do. In talking to them, they’re into Canadian type of farming and operations. These operations will set an example for the smaller operations. I think there is a positive trajectory.”

TECHNOLOGY PRESENTS A TOOL FOR FARMERS AND HERDERS ENSURE SUSTAINABILITY

At Farming Smarter’s Global Crop Production Conference, Badruun presented a tool developed over the last two years to address some of these challenges. The Ministry of Agriculture in Mongolia initiated a Smart Agriculture Initiative partly funded by the World Bank.

This digital agriculture platform incorporates satellite imagery with government weather data and provides it to farmers and herders via a computer or mobile device. It also supports third party sensors. This combines to give a detailed, up to date picture of Mongolia’s soil and vegetation profile.

Many farmers are very crude with their management of water – if it seems dry, they turn it on – if it seems wet, they turn it off. This tool can improve irrigation management.

“We can collect data on recent precipitation and use our platform with irrigation water management systems,” said Badruun.

The aim was to create a platform that is accessible to more people by overcoming the language barriers and technical expertise needed to use satellite images in decision making.

The data could assist with overgrazing too.

“(We can see that) most of the farmed grains go to the flour mills, and only a small percentage goes to these individual herders,” said Badruun. “Most of the feed that they feed to livestock in the winter comes from the native grasslands. They will cut them down, collect them and bring them to the herds during the winter. Our platform can have accurate data of the number of livestock in each region and corresponding available fodder in that region. Herders would be able to use our platform to decide where they would collect fodder.”

Badruun also wants a social function to the platform, connecting herders and farmers with expert consultants or ag service providers.

“I understand that satellite images won’t solve climate change, food security or sustainability problems, but it will definitely become a good tool to help with risk management.” **FS**



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On the cutting edge of agriculture.

Finding the sweet spot for rolling silage cereals

BY LEE HART



Rolling a cereal plot immediately following seeding.
PHOTO: FARMING SMARTER



Heading barley plant rolled in the first node stage.
PHOTO: FARMING SMARTER



Rolling in the 3-5 tillering stage. PHOTO: FARMING SMARTER

After two years of Farming Smarter research trials with a third year to go in 2024, results show if you plan to roll wheat and barley silage crops the optimum time is when the crop is at the two to three leaf stage.

Rolling fields earlier won't necessarily hurt the crop, but for farms exposed to strong spring winds it may leave the soil more vulnerable to wind erosion. And if you leave field rolling until the three to five tiller stage and certainly into the two-node crop stage there is increased risk of yield reduction.

Once technicians analyze the data from summer research trials in late 2024, the project should have a more definite recommendation, says Trevor Deering, Farming Smarter manager of commercial innovation projects. "But from what we saw in the 2022 and 2023 trials, everything points to that two to three leaf stage as the ideal time to roll fields."

The issue at hand is to identify the optimum time to roll fields — level out any ridges, soil clumps and push rocks into the ground — so the silage crop can be efficiently harvested. But it involves finding that sweet spot between rolling too early, which can increase the risk of soil wind erosion and rolling late, which increases the risk of reducing both grain and biomass yield.

"Our various trials over the years involved plots of irrigated wheat and barley silage crops seeded under conventional tillage as well as zero-till cropping systems," says Deering. "In this part of Alberta, strong winds in early spring can lead to soil erosion. Many farmers like to leave fields a bit rough after seeding, as stubble, and soil ridges help protect soil until the crop gets up and growing. But on the other end forage harvesters, many of them being custom silage operators, want fields as level as possible so their harvester headers aren't damaged by rocks and soil during the cutting operation."

Southern Alberta crop consultant George Lubberts, owner of Complete Agronomic Services at Nobleford, first raised the question of when to roll fields in 2020.

He had several clients rolling fields at different times. Lubberts contracted Farming Smarter services to study the timing issue during the 2020 and 2021 growing seasons.

And as a follow-up to that, Farming Smarter received proposal funding in 2022 from the provincial ag research agency known as RDAR (Results Driven Agriculture Research) to support three more years of research into the timing of field rolling of both wheat and barley silage crops. Funding for the project was also provided by the Alberta Wheat and Barley Commissions, now known as Alberta Grains.

During the first two years of the study, Farming Smarter set up research plots at three locations — Lethbridge, Stirling and Bow Island — and involved replicated plots measuring two metres wide by 14 metres long, seeded under both conventional and zero till cropping systems.

They rolled the plots at varying times:

1. check plots untreated, with no crop rolling
2. day of seeding, right after seeding
3. about three days after seeding, at the coleoptile stage (that's when the seed has germinated, but the crop has not yet emerged)
4. at the two to three leaf stage
5. at the three to five tiller stage
6. at the two-node stage, and

Deering says results indicate there was no adverse effect on the crop by rolling fields early — day of seeding and at the coleoptile stage — but there did appear to be increased soil erosion.

"The ideal time appeared to be at the two- to three-leaf stage," he says. "There was enough crop cover to protect soil and no evidence of damage

to the crop or yield. Even into the three to five tiller stage there was little evidence of damage to the crop.”

However, once the rolling was left until the crop was at the two-node stage, evidence emerged that the crops were shorter and there were also fewer plants. “As we looked at yield there was a reduction in both biomass and grain yield for both wheat and barley when the crops were rolled at the two-node stage,” says Deering. “It wasn’t a huge difference, not statistically significant, but there was a pattern of reduced yield.”

He says while some producers believe that rolling later might increase yield by causing the plants to stool out or tiller more, research showed the opposite effect. Rolling later did not appear to increase tillering, and the crop was shorter and thinner. “Rolling later bent the nodes and often the plants stayed bent over right until harvesting which would make it more difficult for the header to cut the crop,” says Deering.

His summary, “rolling at the two-node stage does appear to reduce plant height in barley, decrease seed yield in both wheat and barley under the conventional tillage

system and potentially caused more leaf disease in barley where conditions were conducive for disease development.”

Mike Gretzinger, Farming Smarter research co-ordinator, agrees two to three leaf is the sweet spot because that’s where they saw the most consistent yields (frequently higher than the checks).

“I also found it interesting in the early timings — rolling right after seeding or waiting a few days for the coleoptile stage — sometimes it made a difference, sometimes not. It looks like sometimes it delayed emergence or had effects rolling right after seeding. Like all things, the specific field conditions probably had a big impact. The further you stray off that ideal timing, the more inconsistent the response becomes, which means in some years it might not affect you, but in other years could mean yield losses.

He says in most cases, the later rolling at the node stage resulted in a stunted crop and plants didn’t fully recover from the rolling injury. “The crop did straighten up after rolling, but many had this hockey stick looking shape and I would say at some sites

that later rolling resulted in more crop lodging too. “We see the same growth response when trying to kill fall rye with a roller crimper — where it gets flattened over but then starts growing straight up again.”

“And it all sort of makes sense,” he says. “The crop is a bit like humans. You can bounce back from an injury easier when you’re in your later childhood and teens, but when you’re an infant the injury might last a lifetime and later in adulthood it takes a lot longer to heal. If you delay rolling, the crop is getting closer to maturity, rolling causes injury and the crop doesn’t recover as well. At the node stage, all the 2023 sites for wheat and barley yielded lower than the check.”

For the 2024 research season, Deering says the only change is the plan for research plots at Lethbridge, Stirling and Barons instead of Bow Island. “Otherwise, the plan is to keep everything the same under conventional and zero till cropping systems with the same treatments,” says Deering. “Once we analyze data from this final year, we will have a total of nine site years of research data and the information needed to make a confident recommendation.” FS



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Instability in monthly energy bills is a struggle for farmers in Alberta, especially with our extreme weather conditions. There are limited options for stabilizing energy budgets, and in the agricultural industry, expense predictability is critical for remaining profitable.

The energy market experiences frequent fluctuations and consistency in energy bills is hard to come by. This presents numerous challenges for Albertan farmers as these fluctuations often result in significant financial burden and every month bring worry about paying bills. It's growing more important every day for farmers to manage energy costs and keep a close eye on what's driving their energy expenses.

Even if you have a handle on how much energy your business is using, consumption is only one part of the equation. To accurately capture current and future costs, you need to understand how much you're paying for the power you consume - and that number encompasses several factors, such as energy market cycles, government decisions, economic conditions, global events, and type of energy contract. While it is unfortunately impossible to predict the future, you can consider these relevant factors to estimate the direction prices are likely

headed each month. You can also use these factors to determine a good time to lock in your rates.

Business leaders know how important it is to understand and predict operating costs. The money you spend on energy each month decreases your profit margins and limits the funds available to invest in your business. And the cost of energy can be significant, especially with the unpredictable weather we see in Alberta. Instead of viewing energy expenses as an unavoidable burden, farmers can seize the opportunity to optimize their budgets through a smarter approach to energy management.

Enter DNE - a leading provider of sophisticated energy management solutions tailored to meet the unique needs of farmers. With a deep understanding of the intricacies of energy consumption within agricultural operations, DNE takes a deep dive into business structure and growth plans to create a personalized and comprehensive approach to energy management, prioritizing the long-term success of each client.

One such success story is Euroshield, a company dedicated to sustainable roofing solutions. Faced with the challenge of navigating fluctuating electricity costs in the open market, Euroshield

turned to DNE for guidance. Recognizing Euroshield's specific requirements, DNE proposed a tailored block energy program designed to provide stability and predictability in energy expenses. This program provided Euroshield with the opportunity to secure a fixed monthly power amount based on their usage needs, risk tolerance, and budget forecasts.

The results were impressive, with Euroshield experiencing a 55% reduction in electricity supply costs compared to average market rates. By opting for this program, Euroshield gained stability and predictability in their energy expenses, and a significant decrease in their monthly costs.

DNE's impact extends beyond mere cost savings and budget stability. By partnering with DNE, businesses gain greater control and peace of mind regarding their energy management strategies. Through proactive energy procurement and innovative solutions, DNE helps businesses not only save money but also contribute to a more sustainable future.

Central to DNE's approach is the concept of energy audits, a vital step in understanding and optimizing energy consumption. By evaluating everything from equipment specifications to peak-demand usage patterns,

DNE provides clients with valuable insights and recommendations for optimizing energy use.

Moreover, DNE's role doesn't end with the audit. The company's energy management team works closely with clients to develop and implement tailored strategies for ongoing energy monitoring and savings, ensuring a more consistent and optimized energy bill.

Armed with this newfound knowledge and strategic guidance from DNE, businesses can make informed decisions to optimize their energy usage, reduce costs, and drive long-term sustainability.

Once you're armed with crucial information regarding your energy consumption you begin to look at your processes and equipment through a smarter lens and navigate the complexities of energy management with confidence, unlocking new opportunities for efficiency, savings, and success.

Struggling with energy costs at your farm? Partnering with DNE puts a leading North American energy management and procurement firm in your corner. Contact our team of Alberta energy market experts to learn more. Who said budget stability can't be as easy as flipping a switch?



2023 Research Overview

PARTNERSHIPS

Farming Smarter works in conjunction with highly skilled scientists and professionals from government, post-secondary, and industry to address crop production needs in southern Alberta.

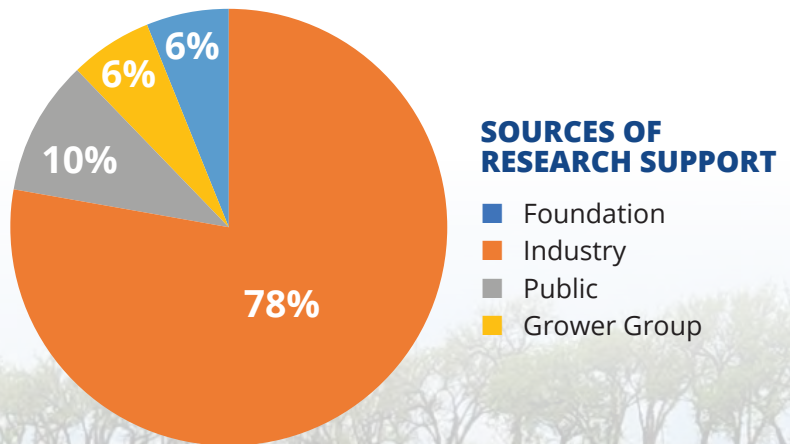
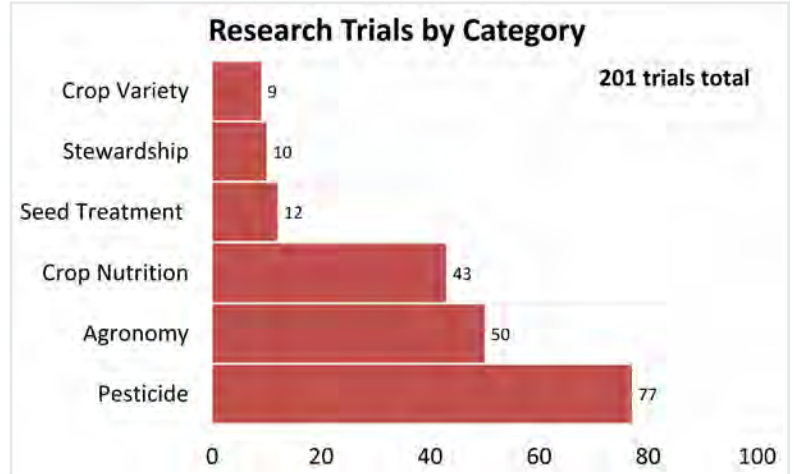
2023 RESEARCH OVERVIEW

Primary research locations: Lethbridge, Brooks, Bow Island, Stirling, and Taber

- 201 research trials
- 179 small plot and 22 on farm trials
- Supported by
 - 2 foundation partners (RBC Tech for Nature and Weston Family Foundation – 12 trials)
 - 31 industry companies – 156 trials
 - 10 public sources – 20 trials
 - 2 grower groups – 13 trials
- 5 Post secondary institutions
- 80 post-secondary student training

2023 KNOWLEDGE NETWORK OVERVIEW

- 928 participants at nine events
- 70 Popular press articles
- 14 press releases
- 91 video releases
- Two magazines
- Over 10,000 website users
- Over 16,000 social media followers



COMMUNITY INVOLVEMENT

4-H Youth

Farming Smarter enjoys collaborating with the community and fostering youth involvement in agriculture. Each year, we invite 4-H members to speak at our Conference & Trade Show and host a silent auction with proceeds going to the club. In 2023, we hosted eight speakers and raised approximately \$7,500 to donate to 4-H!

Alberta Open Farm Day

Alberta Open Farm Days is a collaborative, province-wide, two-day event that gives Albertans an opportunity to experience the farm and understand local food production.

Farming Smarter began participating in 2016 by opening its farm to urban residents. Our event involves local community organizations and industry. The 2023 event had 17 partners from the Lethbridge community. EQUUS ran the barbeque while other partners hosted Learning Centers and populated booths that allowed 301 attendees to learn the intricacies of agriculture.

Lethbridge College Students

Through a partnership with agriculture programs at Lethbridge College, agriculture students visit Farming Smarter to get hands on learning about working in research. In 2023, college professors and Farming

Smarter researchers involved 21 students in hands on learning and 59 attended the February conference.

Summer Students

Farming Smarter hired 10 summer students and one intern from France.



Full Farming Smarter 2023 staff. L to R front: Trevor Deering, Claudette Lacombe, Morgan Hetesy, Michaela Gateman, Blake Heller, Opeyemmi Olaogun, Kevin Beauchamp, Rachelle Phillips, Gabe Mantello, Daniel Parra. L to R back: Jamie Puchinger, Keilan Hakstol, Ken Coles, Gurbir Dhillon, Liam McKay, Mike Gretzinger, Carlo Van Herk, Paul Taisne, Lewis Baarda, Grant Nelson, Sara Gate-man, Sean Kjos, Toby Mandel.

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Details on farmingsmarter.com/sponsorship-opportunities

Practical solutions for southern Alberta farmers

Each year, Farming Smarter leads or collaborates with partner institutions on 20-25 research projects, (75-80 individual trials) on a range of major grain, oilseed, and pulse crops. Farming Smarter also leads in aiding the adoption of novel, specialty crops to enhance crop diversification and promote the value-added crop industry.

2023 was a gap year for much of the Agronomy research world, as a new five-year federal funding cycle began and many projects wrapped up or awaited new approvals. In early 2023, we completed analysis of the biostimulant and hemp herbicide screen trials and sent off final data for the University of Manitoba rotational study.

It was also the final field season for the Strip Till Canola project. Hemp and Quinoa projects were on hold until 2024, but we did still seed more rice and novel fall-seeded crops such as Camelina. We also continued work on the Lakeland College Maximizing barley trial and AAFC Ultra Early Durum.

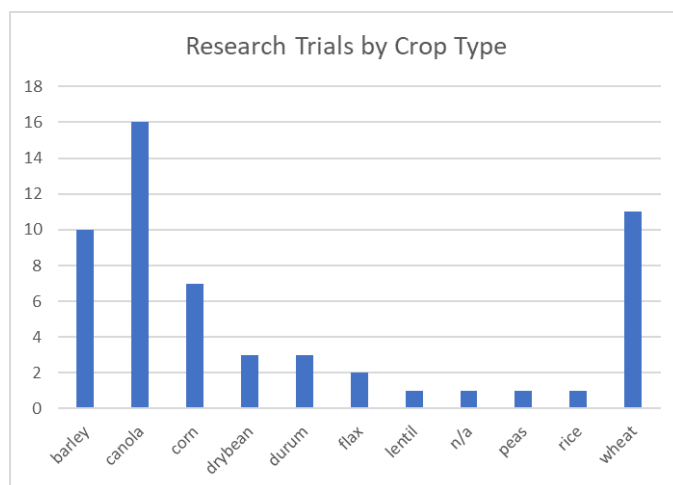
Farming Smarter depends on grant funding from federal and provincial agencies such as RDAR as well as other private foundations such as RBC and Westin. We typically need to contribute 20-50 per cent matching cash and/or in-kind services to every project. Industry collaborators allow us to use that investment to increase our research abilities and achieve far greater trial capacity for farmers. By working with Farming Smarter, project partners leverage grant funds, access diverse geographical trial locations and get a professional team for project execution and data management.

We continuously engage with farmers and industry partners to switch knowledge gaps into practical research ideas.

While working through the application to become a Living Lab, we engaged with regional stakeholders and discovered research opportunities to address the needs of farmers and industry across southern Alberta. We hope to bring these opportunities to fruition in the future through stakeholder partnerships.



French Exchange Student Paul Taisne harvests plots. Paul enjoyed learning to operate new equipment and quality control data on the monitor. French Exchange Students work a semester in a foreign country and pass an English proficiency exam as a degree program requirement. Paul improved his English and our French significantly over the summer.



AGRONOMY RESEARCH TEAM

• **Dr. Gurbir Dhillon** (Research Scientist)

• **Mike Gretzinger** (Research Manager)

• **Carlo Van Herk** (Field Co-ordinator)

Students: Liam McKay, Kevin Beauchamp, Opeyemmi Olaogun (Yemi) and Paul Taisne French exchange student

2023 TRIALS:

I) Agronomy/Fertility

- Maximizing feed barley yield while minimizing lodging (Lakeland College; 2022-24)
- An ultra-early Canadian Western Amber Durum (CWAD) seeding system to determine potential of early CWAD plantings into cold soils (Agriculture Agri-Food Canada) 2020-24
- Flax variety trials (Sask. Flax Development Commission)

II) Sustainability and Soil Health

- Saving Soils: Sustainable management practices for irrigated high value cropping systems (RBC Tech for Nature; 2022-24)
- Saving Soils II: Improving soils through fall-seeded cash and cover cropping (Weston Soil Health Foundation; 2023-27)
- Effect of strip tillage and precision planting on canola emergence, seed yield and quality (Farming Smarter; 2021-24)
- Corn intercropping strategies for extended winter grazing of beef cattle (University of Manitoba; 2020-24)

III) Novel crop adoption

- Evaluation of upland rice production in southern Alberta (University of Lethbridge)

IV) Industry Partnerships

- BASF Seed Canola trials for seeding rates, dates and tillage methods
- ASLE greenhouse gas emissions study
- Bayer corn varieties and herbicides
- Lucent Biosciences/Co-op Fertilizer trials
- Research and Demonstration trials with FMC
- Pulse breeding screen trials with SeedNet



Kevin (BL) and Liam (TR) record plant counts for the final seeding date in the AAFC Ultra Early Durum study before it grows any bigger! 2023 planting was at Easter, while 2022 planting was on Valentines Day (Feb 14). Larger plots in the background show the variability in plot stages and made a nice bar chart in the field.



A subscriber (Dave Waldner) brought a sample of lentils to staff for a check on root rot

Continues on next page ▶

BE READY TO GROW AN AG CAREER

You don't need to have grown up on a farm to have a future in agriculture - you can get your start in this growing industry right here. At Lethbridge College, in just four years, you can get an Agriculture Sciences diploma, a Bachelor of Agriculture Science degree and the knowledge, skills and confidence to be ready to enter Alberta's thriving, diverse ag sector.

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BE READY.



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Martin Dok (top left) and Abraham Armah (bottom left) of ASLE train summer students Yemi Olaogun and Rachelle Phillips to use greenhouse gas chambers to collect N₂O emissions. To collect the emissions, technicians install a plexiglass box in the soil and leave it open to the elements. At sampling time, they install a lid and use a syringe to withdraw an air sample into a sealed vial. They take samples at various intervals (e.g., 0, 10, 20, 30 min) to create an emissions chart for each fertilizer treatment. More often, companies recognize the value of environmental data for product development and sales. Morton Molyneux of K2 Communications (far right) films the lesson for future reference.



Rice growing in Lethbridge September 2023. In 2022, we studied planting and irrigation systems best suited to establish rice in southern Alberta. In 2023, we studied seed treatments and planting dates to see if we could get mature grain to harvest.



Isaiah Vallecillo

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Adavelt™ active

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Exploring our path forward

Commercial Innovation is the process of conducting small plot and field-scale contracted research trials in close partnership with various agriculture companies from Canada, United States and even around the world.

The research helps to understand product performance in pesticides, crop varieties, crop inputs (nutrients, biostimulants and others), and management practices. Farming Smarter provides high value, third party, and unbiased research that offers companies confidence they can develop products that work. Ultimately, the products make it onto farms that need them to control pests and improve production.

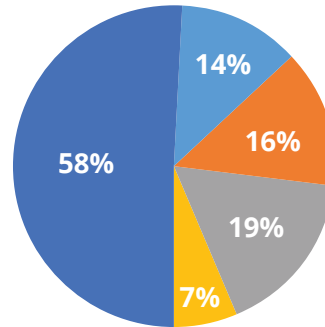
Farming Smarter takes pride in contributing to the product development pipeline that ensures farmers have products that help them deal with tough problems. Farming Smarter reinvests proceeds in land, equipment, and personnel to conduct high quality and innovative research projects.

Improved/increased resources allow us to increase our capacity for contract and our grant-based research. Commercial Innovation research makes it possible for us to use income from its program on grant applications for our Agronomy Research program. This draws industry partner investment(s) and spreads the cost between Farming Smarter and the industry partner(s).

We see a need to collaborate with new companies and companies moving into the southern Alberta market. We help them understand our climate, farming practices, and how a product could fit. We help companies get successful products suited to southern Alberta needs to farmers.

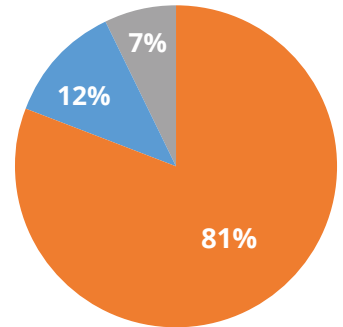


Both photos are early seeding date (Left Aug. 30th; Right Sept. 5th) and high seeding rate (7.8 lbs/acre). Left is shallow seeding depth of 0.5" and right is deep seeding depth 1". Pictures taken Dec. 18, 2023.



TYPES OF COMMERCIAL RESEARCH 2023

- Agronomy
- Crop Input
- Nutrient
- Variety
- Pesticides



TYPES OF PESTICIDE RESEARCH 2023

- Fungicide
- Herbicide
- Insecticide

Recent investments in equipment provide an increase in capacity and trial quality. In 2023, Farming Smarter invested in a two-row seed pro planter to improve corn variety and other row crop trials. Earlier this year, we purchased a two-metre high speed disc for tillage trials. This will continue to be an important goal for Farming Smarter.

In 2023, we worked with 33 industry partners on 158 industry trials, up slightly from 2022 and double the trials from previous years. We work hard to maintain and increase the number of trials each year to advance Farming Smarter's efforts.

Key to commercial innovation success is our passionate researchers. In 2023, we had 23 zealous staff — 12 full time and 11 seasonal research assistants. We cherish the ability to bring on so many intelligent and eager students that care about farmers as much as we do. We look forward to another amazing year with exciting research projects, amazing people, and much success.

“Farming Smarter is a dedicated group of people with a mission to serve industry partners. They have a high level of staff competency, and the organization is prepared to make investments in people and assets to improve overall accuracy, relevance, and capacity to do research.”

John Gibson
Pillar Lasers Inc.

We continued work on fall seeded camelina (Joelle variety) thanks to the Saving Soils program, funded by the Weston Foundation and RBC. The research trial investigates agronomic practices of seeding rate, data, and depth. So far, we see that the early date, high seeding rate, and shallow seeding depth appears to have grown the best in the fall of 2023, providing the most ground cover in the fall into the spring. Further data collection (plant counts, photos, yield etc.) in 2024 and continuation of the study for another two years will help us understand the best time to seed, how deep to seed, and at what rate to seed. Stay tuned!



Both are late seeding date (Sept. 27th) and high seeding rate (7.8 lbs./acre). Left is shallow seeding depth of 0.5" and Right is deep seeding depth 1". Pictures taken on December 18, 2023.

WE'LL BUILD THE NEXT GENERATION TOGETHER.

The future of farming relies on the next generation to build on current successes and those still in the making. Planning now will put you and your farm on the right path. AFSC's knowledge and understanding of the challenges in farm planning, risk mitigation and financing can help you get there.

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Field-scale support for southern Alberta



You can see the difference in manured and non-manured research plots.



Lewis Baarda and Will Friesen checking on seed depth while seeding across tillage treatments in the canola strip till trial.



Rachelle Phillips measuring manure trial corn heights



Fall rye cover crop emerging under the canopy of an established sugar beet crop

The Field-Tested program conducts practical and usable agronomy research on farms right here in Alberta. A warm dry climate and irrigated coarse-textured soils create growing conditions different from other regions in the country. This generated a diverse and profitable specialty crop sector that includes alfalfa seed, canola seed, dry beans, potatoes and sugar beets.

Many of Alberta's specialty crops have a small footprint in terms of total acreage but have an outsized impact on our regional cropping system overall. Locally relevant research for these specialty crops does not have the same broad appeal as more common crops such as wheat, peas and canola. The industry tends to draw on research and innovation generated elsewhere, often eastern Canada or American Northwest or Midwest. Specialty crop growers adapt this knowledge locally using trial and error and on-farm tests. The robust growth of the industry speaks to their success.

However, Alberta needs regionally relevant research generated right here. The Field-Tested program builds capacity and expertise to address unique research gaps. Our team uses scientific trials to validate ideas from other places. This work identifies practices Alberta farms can deploy or cull so that 'bleeding edge' growers don't compromise resources and production. We plan to build a body of locally relevant knowledge right here in southern Alberta.

Field Tested works to fill this need and provide agronomic research for a variety of small-acreage crops including:

- **Alfalfa seed research program:** This will be year four of agronomy field trials serving seed alfalfa growers. Trials focused on evaluating the potential of PGRs, desiccation products and practices, and strategies to cope with alfalfa weevils.
- **Garden Pea Cultivar Trial:** In partnership with Nortera Foods, evaluate the viability of fresh pea cultivars productive in other places. Understanding performance of these cultivars in terms of days to harvest, harvest window, and overall yield is critical to harvest scheduling and achieving maximum production.
- **Silage Corn and Manure:** Plentiful cattle manure led a local agronomist to ask how it impacts emergence, stand and establishment of silage corn crops. Two field experiments showed that corn grew taller and faster in the absence of manure (baseline fertility being equal). However, manured and non-manured plots had similar silage yields.
- **Cover Crops to mitigate soil erosion:** High disturbance specialty crops such as potatoes and sugar beets leave soils exposed to wind erosion over winter. A series of small-plot and field trials test different approaches for establishing cover crops following harvest.

Our 2024 research program is under development. We will continue most of the projects noted above and some new ones that should interest growers in the region. We will expand our capacity and expertise to address the irrigated specialty crop research gap with intent to concentrate on irrigation management and potato production.

Extreme drought and irrigation limits in 2023 highlighted the need for continued research into water management. Our current funding applications focus on technology to help irrigators determine when, how much and where to deliver water to specific crops. This work will support farm scale decisions around priority fields for water based on crop need, resilience and profitability.

Farming Smarter has equipment to serve the research needs of a rapidly growing potato industry. A two-row potato research planter will arrive shortly that will allow small plot research. Our team engages with local farmers, agronomists and processors to establish research priorities. If you visit Farming Smarter this summer, you will see potato research plots on site along with many other crops. Potatoes are just one more crop we develop world class agronomy for Alberta growers. **FS**



Sara Gateman and Kyrsten French with a large fresh pea sample ready for threshing



Alfalfa weevil larva captured in a sweep net for a seed alfalfa insecticide trials



Potato cover crops growing very well in the fall of 2023.



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ECONOMIC IMPACT ANALYSIS

Farming Smarter contributes to the economic well-being of crop producers through its knowledge sharing activities that promote practices, crops and technologies that either improve on-farm profit or reduce expenditures. We calculate that impact at \$220 million/year based on the following calculations/information.

Farming Smarter extension \$10.8 Million

- +Obtained from digital analytics with the assumption of 2,000 acre farm size and \$0.01/acre impact

Research program \$59 Million

- *Calculated by using average return on investment from the following studies 40:1
1. Review study of 292 studies. Most common return was 30:1 mean was 82:1 Source: Alston, J.M., C. Chan-Kang, M.C. Marra, P.G. Pardey, and T. J. Wyatt. A Meta-Analysis of the Rate of Return to Agricultural R&D: Ex Pede Herculem. IFPRI Research Report No. 113, 2000.
 2. Book Persistence Pays: U.S. Agricultural Productivity Growth and the Benefits from Public R&D Spending. J.M. Alston, M.A. Andersen, J.S. James and P.G. Pardey, Spinger January 2010. 32:1 return.
 3. The returns to WGRF cereal research 1994-2030 – Gray Nagy, Guzel (2012) 36:1 return
 4. Zero till research 52:1 Gray and Nagy (2011)
 5. Regional Variety trials 1971-2010, 63:1 benefit cost returns
 6. Sask pulse growers 24.6 to 1

Public media impressions \$44.3 Million

- Calculated based on reach of publications with the assumption of 2,000 acre farm size and \$0.01/acre impact.

Event participants \$106.8 Million

- Information obtained directly from farmers

EVENTS

- Farming Smarter Conference – February 15 & 16, 2023 (188 people)
- Pesticide Applicator Online Workshop – March 23, 2023 (80 people)
- Field School – June 15, 2023 (67 people)
- Cover crop & nitrogen management tour – June 22, 2023 (28 people)
- Plot hop – July 13, 2023 (44 people)
- Open Farm Days – August 19, 2023 (301 people)
- Global Crop Production Virtual Conference – Dec 14, 2023 (36 people)

Continuing Education Credits

Certified Crop Advisors received 27.5 credits and licensed Pesticide Applicators received 9 credits through our events.

49 research presentations at events

Open Farm Day visitors always enjoy getting out into the research plots. Here a tour group visits the corn plots.





Quinn Campbell of Global News interviews Executive Director Ken Coles at a Farming Smarter event in 2023

MEDIA COVERAGE

Farming Smarter values our relationships with media who help us extend the learning from our research. We also publish our own magazine in partnership with Glacier Farm Media.

- Farming Smarter press releases – 14 stories, event invitations and various announcements
- Popular press stories – 70 articles shared by over 25 outlets including Global News, CTV News, Real Agriculture, Top Crop Manager, and Western Producer.
- Farming Smarter Magazine – 2 editions (spring & fall) contained 29 articles relevant to crop production in southern Alberta.



Videographer Morton Molyneux (K2 Communications) produces Plot Shots, event recordings and special videos for Farming Smarter.

VIDEO PRODUCTION

Farming Smarter produced 91 videos.

- We gained YouTube subscribers – now at 2,581
- 29,589 YouTube video views
- 2,072 HOURS of video watched



2024 Program Partners

Farming Smarter invites local businesses to participate in a partner program that can benefit Agronomy Smarts subscribers and Farming Smarter Knowledge and Network program.

2024 AGRONOMY SMARTS SUBSCRIBER BENEFITS



Agronomy Smarts subscribers receive a portable power bank and an LED flashlight compliments of AJM Seeds.
Contact Adrian Moens for details at 403-308-6685



All Agronomy Smarts subscribers can receive 10% off their annual financial statements and year end up to \$500.00 with a free information session
Agronomy Smarts subscribers that become new BDO clients will receive a gift package including a cooler with wheels, mugs, picnic blanket and more.
Contact Amber Bedard (403) 328-5292



Chinook Equipment Lethbridge provides a \$500 rebate on any NEW piece of equipment (excluding attachments) to Agronomy Smarts subscribers. Participants must identify themselves as an Agronomy Smarts subscriber at the start of equipment shopping.
Offer valid to Dec. 31, 2024



Agronomy Smarts subscribers receive 10% off spring soils testing to a maximum of \$1,000.
Our goal is to exceed customer expectations for agricultural testing with a friendly "Down to Earth" experience.
Contact Down To Earth Labs. (403) 328-1133



Agronomy Smarts Subscribers in good standing will receive an FMC branded collapsable shovel compliments of FMC.
Contact: Claudette or Sean at Farming Smarter



Agronomy Smarts subscribers receive two tickets to July 2024 Ag in Motion and 40% off a subscription to Western Producer and Country Guide compliments of Glacier Farm Media
Contact: Claudette or Sean at Farming Smarter



A \$25 voucher for Agronomy Smarts subscribers to use at the Real Agriculture Store
Contact: Claudette or Sean at Farming Smarter for the code



Agronomy Smarts subscribers receive a 20oz Hydro Flask All Around Tumbler compliments of RBC
Contact: Ken Vanden Dungan 403-360-7562

AGRONOMY SMARTS SUBSCRIPTION

Open yourself to a year of learning and idea exchange through the only subscription focused on southern Alberta crop production innovation and advancement. Keep on top of current research, meet peers, and join the fun at our events. \$1,000/year

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- **One-On-One** Access to Our Researchers



This QR takes you immediately to the portal for greater success in agriculture!

Farming Smarter breaks new ground

BY SEAN KJOS



Potato cover crop trial in Lethbridge Alberta featuring various cover crop blends seeded after potato harvest. Different seeding rates (high/low) and seed methods (direct seed/broadcast) were tested in this trial. PHOTO: FARMING SMARTER

Potato farmers in Alberta will want to follow a new Farming Smarter project that will expand regional knowledge of potato agronomy.

We've researched pre- and post-potato erosion control with cover crops, but now we have the means to seed potatoes. This new territory and we invite growers and processors across Alberta to follow our research.

We bought a new seeder and hiller for this program and hired Ashley Wagenaar a conservation agronomist with a wealth of knowledge and experience with potatoes. Wagenaar and Lewis Baarda Field Tested Team Lead will run the program.

"We've done a lot of work on irrigated specialty crops in the past, but we haven't really worked with potatoes. There's a lot of specialized equipment to buy and Ashley's knowledge fits well," says Baarda.

A NEW APPROACH TO AGRONOMY RESEARCH

The plan is to identify local challenges for potato growers, research solutions and expand the research scope.

For our first year, we will conduct small plots trials under irrigation at Lethbridge. Optimizing our land use will allow us to maximize the number of trials we can undertake and research we can complete.

Producers and processors responded positively to initial queries; however, we want to learn and share as much as possible about potatoes. If you have an idea you'd like us to research, tell our team to study it. No idea is too small for this endeavour.

While the team will explore practices, they'll also investigate how to improve nutrient management and overcome limitations in production. With continued stress on prairie water supplies, growers need to operate efficiently with less inputs. Our research hopes to provide growers with information before it becomes necessary.

"Knowing how to grow a potato crop where you really need to watch and manage water is incredibly valuable. We have a great growing season in southern Alberta with minimal disease pressure, so we want to help producers continue to maximize the crop quality while improving the costs per acre," states Wagenaar.

You can contact our Ashley or Lewis Baarda at Farming Smarter to submit research ideas!

EAGER FOR CHANGE, READY TO ACT

The potato industry in southern Alberta has steadily grown with many producers adopting spuds into rotations. There have been multiple investments into expanding the industry and the region's capacity. This growth leads to gaps widening and developing, which the potato research program aims to fill.

Most potato research comes from potato heavy regions in Prince Edward Island and Idaho. While it provides a useful reference for spud growers in Alberta, differences in production may mean potato farmers use inefficient methods.

"We don't have the same soil as Idaho, nor do we farm the same way. Our irrigation and diseases are different, and I think this would mean our planting strategies are different as well," Wagenaar says.

Wagenaar is excited to work with potato growers again. She previously worked as a Little Potato Company agronomist. She hopes to use her experience and knowledge to assist southern Alberta potato growers identify best practices for potato crops.

For Baarda, he is the most content in his work life when he has a new opportunity to learn. He's extremely excited to dedicate an entire year to multiple learning opportunities and the direction this research can go in future years. **FS**



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LNID encourages all irrigators to ensure efficient use of water allocations with little to no waste. The District thanks irrigators for communicating water orders (on and off) 24 hours in advance. This improves delivery efficiencies and reduces return flows.

Due to the forecasted drought in 2024, the District is participating in water sharing discussion with all users in the Oldman River Basin. Keep informed with all District updates as developments unfold by visiting our website or by contacting the office and adding your name to our email list.



Togas not mandatory jeans and boots acceptable

BY C. LACOMBE

I think there is a thing that the agricultural community needs to adopt from its urban counterparts. According to lots of historical references, humanity didn't start higher learning until a bunch of them had the leisure to live in community and not toil for survival. Think Plato's Academy and Aristotle's Lyceum — ok, it took centuries to include women, but that's not the point here.

Humans didn't have the leisure to learn until farmers got good at what they do. So, if you have a higher education, you owe it to agriculture!

The point is that farmers still support the ability of urban residents to pursue other activities because they don't have to forage or farm. However, it's time for farmers, and everyone that works along side them over the hectic growing season, to form their own academies.

You know how certain professions insist its practitioners engage in regular educational activities? Certified Crop Advisors (CCA) come to mind, but I would argue that anyone involved in growing crops needs to stay on top of learning throughout their career/life. Successful farmers do not fall asleep at the wheel — not even with auto steer.



This is a Farming Smarter lyceum in action during the 2023 Rolling Innovation Tour. PHOTO: FARMING SMARTER

Auto steer may work for your equipment, but it won't hold up long term for a whole farming operation. You need to know what's happening outside your fences because it could be a boon or a threat. Surely, you've heard "Innovate or die" somewhere in your conversations. This is a guiding principle at Farming Smarter.

Farming Smarter Executive Director Ken Coles defines innovation this way, "I believe that innovation is a **system** that begins with passionate, creative, and fearless people that have determination, persistence and a need or vision. This is the **culture**.

Next, a **process** must be succinctly and efficiently implemented that includes building a knowledge network, exploring, designing, and testing ideas with feedback and iterative **adaptation**.

As the final step, the ability to evaluate, tweak, or even start over while considering risk, costs, and revenue. Success comes with relentless effort and value accrues through **adoption**. Innovation is about **culture, process, adaptation, and adoption**."

This is the Farming Smarter culture behind our mission statement, "we change the way people farm." Our culture here is like one of those early academies — Ken's Lyceum if you will — LOL. Anyone can come to us to learn, experiment, or debate any idea, practice, product or whatever. We're all ears and, if we can, we'll put together a project to find answers we don't collectively have and likely need.

There's a key difference here between Plato's Academy and Farming Smarter Association. We are not a place we are an association. Wherever you connect with us, you will have the chance to learn AND teach. You can ask questions and suggest answers or methods. Our network is our highest value and everyone in it is equally valued.

No one lies around in a toga here discussing ephemeral thoughts. You will find us out in the sun, dirt and machinery digging answers out of crop research. Or you will find us at conferences and workshops learning and teaching in equal measure.

Maybe for some reason you don't see Farming Smarter as your learning academy, but I suggest that all farmers connect with a network or a place of learning. Find something that picks you up off the farm and drops you into a place where like-minded individuals with different experiences openly share what they know. It gives you the opportunity to learn from others' successes and mistakes and that can be of incalculable worth.

After all, farmers made leisure for higher learning possible. It's time for farmers to give themselves the same advantage. **FS**



This is a Farming Smarter lyceum location near Stirling, AB. PHOTO: FARMING SMARTER

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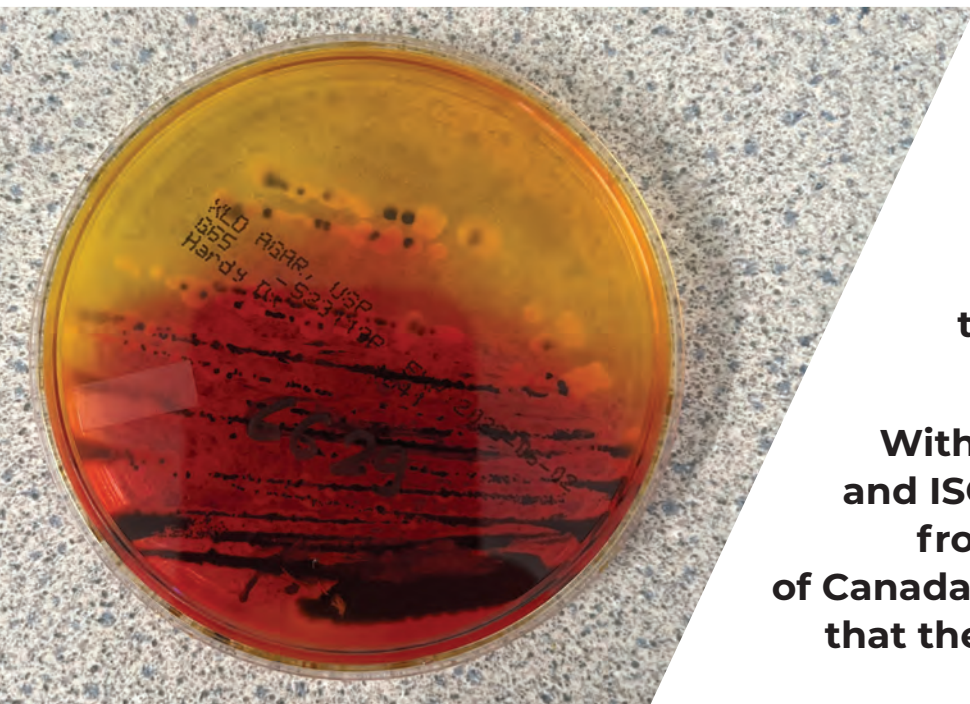


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