

# AGRICULTURAL INNOVATION

**CropSphere 2020**  
Saskatoon, SK  
Jan. 14-15, 2020  
[cropsphere.com](http://cropsphere.com)

**Saskatchewan Beef Industry Conference**  
Saskatoon, SK | Jan. 29-30, 2020  
[saskbeefconference.com](http://saskbeefconference.com)

**Canadian Crops Convention**  
Vancouver, BC  
Mar. 3-5, 2020  
[canolacouncil.org](http://canolacouncil.org)

**AGRI Tech Venture Forum**  
Toronto, ON  
Apr. 30, 2020  
[agritechventureforum.com](http://agritechventureforum.com)

## Saskatchewan: Advancing with Emerging Technologies



**Dr. Karen Churchill**  
President & CEO,  
Ag-West Bio

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In Saskatchewan, science has always been integral to agriculture. Today, digital and biotechnologies are advancing the sector faster than ever. Partners at Ag-West Bio, Saskatchewan's bioscience industry association, shed light on seven emerging technologies in which this province is leading the way.



### Smart ag

"Agriculture has always been smart, but now it's becoming digital," says David Yee of PAMI, a research and development organization that focuses on the agricultural industry. "We see a transition happening: machinery is getting smaller and farming will become more efficient. Inputs will become significantly lower, because we'll be that much more precise."



### Drone technology

At the University of Saskatchewan, Steve Shirliffe is using drones to identify traits in crops, gathering data that could be useful for breeding programs. "We can quantify the length and intensity of flowering, canopy volume, and even the number of seedheads in a given area," he says. "We can also identify changes in soil quality over a field."



### Self-driving farm equipment

The first autonomous farm implements are coming out of Saskatchewan. Dot Technology Corp. has developed a "power platform" that can connect to a wide variety of farm implements to work a field — no driver required.



### Soil science

"Agriculture is becoming a big science," says Dr. Leon Kochian of the Global Institute for Food Security. "It's truly interdisciplinary across biological, physical,

and mathematical sciences." He has assembled a research team of computer scientists, computational biologists, X-ray physicists, soil microbiologists, and engineers, with the goal of incorporating competitive root traits into plant breeding programs.



### Intercropping

Planting multiple crops in the same field takes more planning, but the right combination can mean reduced insect and weed pressure, fewer inputs, and higher yields. Colin Rosengren of Three Farmers says that mixing crops can increase yield by up to 50 percent. "In the next five years you won't see anyone mono-cropping chickpeas," he says. "Flax really reduces the disease pressure."



### Gene editing

Agriculture and Agri-Food Canada scientist Dr. Kevin Rozwadowski is using CRISPR-based gene editing in his crop research. "CRISPR allows you to make precise changes at prescribed places in the genome with predictable effects," he says. "All major crops will benefit from this technology as it speeds the development of certain traits related to disease resistance, drought tolerance, seed quality, flavour profiles, and more."



### Food technology

At the Saskatchewan Food Industry Development Centre, Dr. Shannon Hood-Niefer says that technologies like fermentation and hydrothermal treatments are expanding possibilities for food products and increasing choices for consumers. Saskatchewan has great skills in value-added agriculture and processing. "It's time for us to really step up and promote what we can do," says Dr. Hood-Niefer. "We're more than just primary production." ●

## Ensuring Soil Health to Feed the World

Fertilizer is one of nature's most complex and beneficial resources, as it allows soil to become more productive and yield better crops. Without it, we simply couldn't produce enough corn, wheat, rice, or other crops needed to feed the world's population.

Faced with a growing global population, less arable land, and environmentally-conscious consumers, farmers are looking for ways to grow more crops on the same land while protecting the environment. It's a tall order to be sure, but farmers are up to the challenge.

### Creating better soil health

Finding that unique solution is the aim of 4R Nutrient Stewardship, a science-based fertilizer management program. This innovative, Canadian-made program encompasses a set of principles that encourages farmers to apply the right source of fertilizer at the right rate, the right time, and in the right place.

Each 4R plan is tailored to the unique needs of those involved. How the fertilizer is applied

depends on such factors as the type of crop, regional climate, and soil type.

Research has demonstrated that using the 4Rs to determine the right source, rate, time, and place of nutrient application leads to better uptake by the crop, increasing yields and reducing losses to the environment — including greenhouse gas emissions from nitrogen.

"The agriculture industry is a dominant player in the reduction of greenhouse gases," says Dr. Mario Tenuta, the Canada Research Chair in Applied Soil Ecology at the University of Manitoba. "Using the 4Rs allows growers to achieve better nitrogen efficiency while addressing environmental issues and embracing sustainability."

"Research demonstrates that 4R practices can reduce nitrous oxide emissions released during fertilizer application by up to 35 percent," says Garth Whyte, President and CEO of Fertilizer Canada. "Annually, that's a two to three megaton reduction of nitrous oxide emissions in Western Canada alone."

### Supporting our sustainability goals

One of the major benefits of the 4R program is that it promotes sustainability without sacrificing productivity or profitability.

Fertilizer Canada has several programs available to capture verified acres under 4R Nutrient Stewardship, which helps to tell the story of how the agriculture industry is adopting sustainable farming practices. Through 4R Designation nationally, or 4R Certification in Ontario and PEI, agri-retailers are able to align their business practices with 4R Nutrient Stewardship in order to advise their grower customers on sustainable nutrient management practices. Agreements with conservation groups, provincial governments, and stakeholders are helping to advance this program across Canada.

To this end, Fertilizer Canada offers a number of 4R eLearning courses and certifications to agri-retailers, farmers, and crop advisors that take an in-depth look at the practices and planning required to implement 4R Nutrient Stewardship. It also works with provincial and federal governments to deliver sustainable solutions to producers.

"We want to be a part of the solution for Canada and the world," he says. "We want to help Canadian farmers meet the global Sustainable Development Goals and produce enough food to feed over 9.6 billion people." ●

Catherine Roberts



**Garth Whyte,**  
President & CEO,  
Fertilizer Canada

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# Digging Deeper: Dirt Is Part of Our Climate Change Solution



**Dr. Donald Buckingham**  
President & CEO,  
Canadian Agri-Food  
Policy Institute (CAPI)



The trouble with soil is that it's just not sexy. In fact, it's downright plain, unremarkable, and messy. Most people think it's simply a mixture of broken rocks and minerals. But soil is so much more than that. Healthy soil is full of living organisms and quite the environmental workhorse in the benefits it provides to us all.

## Let's start with biodiversity

Soil contains one quarter of the Earth's biodiversity. One hectare of soil can include 2.5 million earthworms, trillions of fungi, bacteria, and protozoa, and billions of arthropods and algae. That's a lot of biodiversity for 2.5 acres of dirt.

## Then there's soil carbon sequestration

Agricultural land sits on large stocks of stored carbon and has the potential to sequester more carbon, unlike most other sectors. Granted, growing crops contributes to greenhouse gas (GHG) emissions from fertilizers, manure, and tillage. However, with the adoption of Best Management Practices, crop rotation and cover crops, rotational grazing, precision agriculture, and no-till practices, there have been significant increases in soil carbon storage over time. Consequently, GHG emissions on Canadian croplands have sharply declined since the 1990s. So, let's keep the carbon in the soil and out of the air.

## Finally, regenerative agriculture provides the whole package

The regenerative agriculture system improves soil health, reduces GHG emissions, and increases the carbon content of soils. This is because of the system's best practices, which drive carbon into the soil and keep it there. The resulting carbon-enriched soils are healthier, demonstrating better resilience to extreme weather, improved water permeability, increased microbial diversity, higher yields, lower input requirements, and more nutritious harvests — all of which improve the land and the farmer's bottom line while mitigating climate change.

(CAPI), we're leading the way in developing policy options to improve soil health and maintain natural capital so that agriculture can contribute even more as a solution provider to climate change.

Throughout history, civilizations have prospered or declined as a function of the availability and productivity of their soils, and now the very soil we walk on offers us, as well, the possibility of saving the planet from global warming. It's something to think about when you tramp on that "plain old dirt." •

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# Agriculture Has Changed, but Has Our Support Strategy?

With a growing global population and an increased need for food, there must be a greater emphasis on "how to grow food." With that, innovation becomes a necessity.

The growing speed at which innovation is being introduced in agriculture requires us to carefully analyze the impact on producers, regulators, and consumers. Producers are embracing innovation as it's enabling them to produce greater yields, be increasingly efficient, and achieve higher returns on investments.

However, the cost of innovation is, occasionally, prohibitive and leaves some producers on the sidelines. While Canada is an innovation leader in the agri-food sector, adoption of innovation is much slower to occur. This isn't a healthy situation and governments should look at mechanisms to support the adoption of innovations by farmers at a greater pace.

Governments' ability to keep pace with innovation will also be crucial as the sector adapts. To achieve this, the sector must identify regulatory obstacles and be open to working with the government to find solutions.

Finally, we need to make sure that consumers understand innovation. The romantic picture of the farmer, with a hay straw in his

mouth, wearing suspenders and a straw hat, and standing by a nicely-painted red barn is far from the reality.

Robots, drones, iPads, smartphones, and more are key components of modern farming. It's unclear whether consumers understand the new reality of farming and whether they would embrace it.

It's essential for the agri-food sector and governments to support campaigns designed to enable consumers to better understand where their food comes from and to know that it's safer than it has ever been.

Innovation in agriculture presents some challenges but brings with it great opportunities. •

Serge Buy



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# Cultivating Advice for a Successful Farm Transition

A transition plan is critical for any business, but when it comes to Canadian farm owners, most are unprepared to hand over operations.

According to Statistics Canada, the average Canadian farmer is 55 years old — an age where many are looking ahead to retirement. However, close to 92 percent of farms have no written plan for transitioning the business once the farm operator retires.

"We're seeing a wave of farm transitions across the country, with farms changing hands from older to younger generations," says Liz Robertson, Executive Director of the Canadian Association of Farm Advisors (CAFA). "However, only about 8 percent of farmers actually have a succession plan in place."

While there are some resources available, finding accurate and reliable information for a successful transition plan isn't easy.

"The process can often seem overwhelming, and it can put a huge strain on the business and the family," says Robertson. "They need help navigating this increasingly complex transition."

Manitoba-based CAFA is a multi-disciplinary, non-profit organization of Canadian farm advisors, with a mission to improve the quality of advice being given to farm businesses

and farm families. The organization has more than 650 certified members across Canada, from accountants and tax lawyers to agricultural economists and family coaches.

"We ensure our members are always improving their skills, knowledge, and expertise by arming them with continuous learning opportunities like seminars, conferences, and networking sessions," says Robertson.

Members of CAFA also bring passion and credibility to their clients — close to 95 percent of advisors have a direct, personal connection to farming, whether they come from a farming family or own their own agricultural business. •

Melissa Legaspi

For more information about CAFA or to find a certified advisor near you, visit [cafanet.ca](http://cafanet.ca).

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# It Starts with a Seed

Take a minute to consider the small but mighty seed. When you think about Canadian agriculture, it may not be the first thing that comes to mind, but nine out of ten bites of food start with the planting of a seed. The food we eat, the feed for livestock, even some of the fuel in our cars — all of these and more can be traced back to a seed being planted. The more investments we make in seed improvements, the more positive effects there will be on the economy, the environment, and our overall quality of life. Seed is the key component that powers the agricultural value chain and delivers innovation to farmers.

The seeds planted today have been improved over centuries through research, development, and evolving scientific techniques. Plant breeding often starts with a need for improvement, such as better taste, enhanced nutrition, different size, or the ability to withstand disease.

## Seed improvements can result in:

- Produce that's healthier, better tasting, and more nutritious;
- A wider variety of food to give consumers more choice;
- Innovations to help farmers grow successfully, like mildew-resistant spinach and drought-tolerant corn;
- Less food waste because of new varieties that stay fresh longer;
- Plants that reduce soil erosion and use water more efficiently;
- More food and feed produced from the same land, like grasses and grains used for feeding cattle.

Modern scientific breeding methods have become much more precise. Plant breeders can identify a variety of combinations with desirable characteristics and then work with specific genes in the plant to enhance or minimize certain qualities. Without researchers' efforts, crops could be ruined by insects, drought, or excessive rain.

Plant breeding research requires major resources, with an average of 10 years and at least \$1 million to develop one new cereal variety. Right now, private sector investment is leading the way. Seed companies invested \$171 million in research and development in 2017. Putting money into plant breeding is proven to be an excellent investment, with an average return of seven to one. That's \$7 for every \$1 spent. The seed industry needs a regulatory and intellectual property environment that encourages investment in innovation so that farmers can access the best products.

Plant breeding has existed since the beginning of agriculture and can be credited with helping to feed an expanding population — and we're not done growing yet. It's an exciting time in the seed industry, with planned opportunities for regulatory modernization and an increased recognition of the role of innovation in agriculture. Our mission at the Canadian Seed Trade Association is to foster seed industry innovation and trade. The way we see it, better seed equates to better life.

## What is the Canadian Seed Trade Association?

The Canadian Seed Trade Association (CSTA) represents more than 130 members engaged in all aspects of seed research, production, marketing, and international trade. CSTA's members are proud contributors to our nation's economy and to the health and well-being of Canadian consumers. Seed is the vital first link in the entire agriculture and agri-food industry, contributing over \$6 billion to the economy, employing over 63,000 Canadians, and exporting more than \$640 million annually. •

Dave Carey

To learn more about the CSTA, visit [seedinnovation.ca](http://seedinnovation.ca) and follow them on Twitter @SeedInnovation.



**Dave Carey**  
Executive Director,  
Canadian Seed Trade  
Association (CSTA)

“Seed is the vital first link in the entire agriculture and agri-food industry, contributing over \$6 billion to the economy annually.”



Left image: Andria Karstens, Field Product Specialist, working with Josh Butler, FieldView user, in Croton, ON.  
Right image: Farmers can view their field data on an iPad and use side-by-side maps to view and compare different data layers from multiple years.



## Reshaping Future Generations of Farming Through an Intuitive Software Platform

Agriculture is a cornerstone of the Canadian economy, contributing more than \$100 billion to it annually. Domestic farmers produce a wide range of field crops, ranging from flax and soybeans to corn and wheat. Around everything they grow, choices must be made about key issues like the optimal time to plant, and how much seed, moisture, and fertilization are needed for healthy crops. Farming is a complex business with a multitude of moving parts.

To manage all of them, FieldView, an advanced agricultural software platform, can help. It has been a game changer for farmers across Canada and is transforming how they farm. "What it does is gather information from the fields about what's happening there. It monitors in real time things like biomass, environmental conditions, and rainfall," says Denise Hockaday, Climate Business Lead at The Climate Corporation. "The software keeps track of what was planted, where, when, crop yield, and moisture. Many farmers historically had different ways of keeping track of those things, but it was manual, clunky, and not automated. If they did use technology, different software types were unable to talk to one another and the necessary data couldn't be compiled all together."

### Managing fields with intuitive software

FieldView is able to gather a wide range of data in one place. That's essential when, as Hockaday points out, farmers need to make 50 to 60 decisions about multiple fields each and every year. The software was created for farmers, with input from farmers, but not exclusively for them.

"It can also be used by those they work with — a retailer, an agronomist, or an advisor," explains Hockaday. "It allows for collaboration with everyone being able to read the data being recorded. Not only does it save on the manual work of collection, it happens immediately. You can have much more robust management and measurement. We use technology to our advantage to enable that. Real-time data is powerful."

With an accurate, up-to-date picture of what's going on with their crops, farmers can make better decisions and modify them right away as needed. Even as they move their tractors down the rows, the data is captured live and is accessible while they sit in the cab. The information can be retrieved from the cloud-based software platform from a laptop, tablet, or smartphone from anywhere, whether farmers are nearby or travelling. They can manage the logistics of their farm without physically being there.

### Saving time and boosting efficiency

The software has been designed to be easy to use. Farmers who invest a bit of time upfront will reap the benefits with time saving and more efficiently running businesses moving forward. "We hear on a regular basis how intuitive our platform is to use," says Hockaday. "We help

people understand what it can do for them, and then we actually provide support to help people get up and running. Someone will visit the farm to set up the equipment, if needed. They can see their information and get assistance with mapping any field right away."

FieldView also helps to ensure agriculture sustainability with efficient production and quality product. "Sustainability has been at the core of agriculture forever," Hockaday notes. "This is a farmer's livelihood. They're in it for the long haul. They're stewards of land that may have been passed down through their families. FieldView can provide more insights on how to continue to be sustainable or to be more informed about sustainability practices." ●

*Michele Sponagle*

Visit [climatefieldview.ca](https://climatefieldview.ca) to learn more about how FieldView is shaping a new generation of farmers, present and future.

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## New Agricultural Enterprise Management Program Helps Agriculture Thrive

There's perhaps no field in Canada undergoing such an exciting and transformative change as the agri-food sector. Experts predict that by 2050, global food production will need to increase by almost 70 percent if we are to feed the world's ever-expanding population. Those working in agriculture and the agri-food sector in Canada, as elsewhere, need to be aware of the increasing diversity of issues and opportunities that affect food production and food security. While nothing ever did really operate in isolation, the connectivity and increasing complexity of the global food industry today requires us to apply a different lens to the food value chain, from primary food production to consumer-demand and consumption. Technology, transport and logistics, climate change and carbon footprints, food quality and traceability, animal welfare, and 'alternative' proteins, or globalisation and food security, to name a few, are all in play.

In an effort to address the many 'business'

opportunities and constraints linked to agriculture and the agri-food industry, the Dhillon School of Business at the University of Lethbridge developed a new agri-business program entitled "Agricultural Enterprise Management." Through the very generous support of Dr. Cor van Raay and the Alberta Government, the Dhillon School launched the new program in September 2019 as part of its Bachelor of Management degree, designed to develop graduates with an enhanced understanding of the business aspects of agriculture and agri-food management, both at home and abroad.

The goal of the program is to promote the business aspects of agriculture and the agri-food sector. It is designed to introduce students to new technologies which will enhance productivity on the farm; to explore the adaptation of systems and business processes which help simplify traceability and strengthen food security; and to look more closely at how the core functional areas of business (i.e. finance, operations accounting, HR, marketing, and strat-

“There are more jobs in agri-business than there are graduates to fill those jobs.”



Agri-business Case Competition group photo.

egy) are best employed and adapted to help this critical industry thrive.

"Our program is designed to further enhance the 'business of food,' and produce graduates ready to meet the needs and challenges of the global food industry," says Dr. Kerry Godfrey, Dean of the Dhillon School of Business. "There are more jobs in agri-business than there are graduates to fill those jobs. Our program is intended to respond to that demand, and provide graduates ready to take on the challenge, locally, nationally, and around the world."

With its special focus on experiential learning, another way the University of Lethbridge Dhillon School of Business prepares students for opportunities in agri-food management is through its annual Cor Van Raay Agri-business

Case Competition. Operated in partnership with Lethbridge College, this competition brings teams of students together from across the Prairies to examine an agri-business problem and present their solutions to a panel of agri-food experts. "Agri-business is a multi-billion-dollar industry with huge potential for business students. As an ag innovation hub, Southern Alberta is the perfect place to learn about the business of food and food production. Agri-business is an exciting and continually evolving industry with a bright future in Canada," says Godfrey. ●

*Sandra MacGregor*



**DHILLON**  
SCHOOL OF BUSINESS

With an estimated world population of 9.8 billion by 2050, our global food system has to change.

To ensure high quality, nutritious and safe food gets from farms to plates, the agri-food sector must harness innovative approaches to meet global demand.

The **Agricultural Enterprise Management** major at the University of Lethbridge equips students with the knowledge and experience to become leaders in the agri-food industry.

Learn more: [ulethbridge.ca/future-student/ag-mgt](https://ulethbridge.ca/future-student/ag-mgt)

# The Canadian Egg Industry's Remarkable Sustainability Story

Canadians love Canadian eggs. So much so that each of them eats an average of 253 eggs annually — an increase of about 68 eggs per person over the last decade. Baked, hard-boiled, poached, scrambled, or fried — we just can't get enough, and for good reason. Eggs are kitchen staples that are convenient, versatile, and packed with nutrition.

Interestingly enough, they're also eco-friendly! While the demand is growing and egg farmers need to produce more eggs to meet the Canadian taste for eggs, their environmental footprint is decreasing. And it's possible because sustainability is a core tenant of the egg industry.

### Sustainability as a core value

The Canadian egg industry has responded remarkably to the growing demand for eggs. Between 1962 and 2012, egg production increased by 50 percent, and during this same time the industry also managed to achieve a 50 percent reduction of its environmental footprint. Canadian egg farmers now produce 68 percent fewer greenhouse gas emissions and use 81 percent less land, 41 percent less energy, and 69 percent less water.

What has driven such impressive results? "It's a combination of every input that goes in," says

Tim Lambert, CEO of Egg Farmers of Canada. He says that everything from the genetics of the hens to their diets to hen housing advancements and better health management has played a role. "Our farmers have been able to invest in new technologies which help them be more efficient," says Lambert. That includes initiatives like solar and wind turbine-powered farms, precision agriculture, and smart barns that monitor egg output from individual hens, optimal lighting levels, and temperature. "Sustainability has always been part of our DNA," says Lambert. "We're a very progressive industry."

### Quality assurance

The egg industry's commitment to sustainability matters to Canadians, who are increasingly interested in knowing where their food comes from and how its production

is affecting the environment. "People can buy Canadian eggs knowing that this is an industry dedicated to minimizing our impact on the environment while producing to the highest possible standards of food safety, quality, and animal welfare," says Lambert. "They can buy our products and feed their families knowing that we care about the same things they do."

### Continuing innovations

Dr. Nathan Pelletier, Egg Farmers of Canada's Research Chair in Sustainability and Industrial Research Chair for the Natural Sciences and Engineering Research Council of Canada (NSERC) has spent over a decade researching the science of sustainability.

He recently conducted a benchmark study using lifecycle analysis. "Essentially, I look at the system of egg production as a whole," he explains. His research has yielded encouraging data on the industry's sustainability. "Farms are increasingly well-managed and the hens are becoming increasingly efficient, living longer, and having fewer health issues. This improves the efficiency all the way back along the supply chain," he says.

Dr. Pelletier's current research is focused on developing a farm-level sustainability assessment tool that individual farmers can use to calculate their environmental footprint. They will also be able to compare it against benchmarks from other farmers in their region. "It's taking a huge body of research and complex models and distilling this information into a practical tool that can be on the desktop of every Canadian egg farmer," he says.

In its ongoing efforts at innovation and its impressive sustainability achievements, the Canadian egg industry has created a model that works for Canadians now and into the future. ●

*Michele Sponagle*

To learn more, visit [eggfarmers.ca](http://eggfarmers.ca).



**Tim Lambert**  
CEO,  
Egg Farmers of Canada



**Dr. Nathan Pelletier**  
Canada's Research Chair  
in Sustainability,  
Egg Farmers of Canada  
&  
Industrial Research Chair,  
National Sciences &  
Engineering Research  
Council of Canada



Research shows the Canadian egg industry's increase in production comes with a decrease in its environmental footprint.



Canada's egg farmers are leading the way to a *sustainable future*

With innovation and new efficiencies, we're helping pave the path to a sustainable future for the fresh, high-quality eggs that Canadians love.



Read our Sustainability Story at [eggfarmers.ca](http://eggfarmers.ca) to learn more.



# Opening Eyes Through the Lens: How Agriculture Protects Canada's Grasslands

The grasslands that spread like a blanket across Canada's four Western provinces are one of the world's most endangered ecosystems. Yet, many Canadian's aren't even aware. We don't value grass in the same way we do trees. Advocacy for protecting forest habitat and marine life comes regularly to the top of our news feeds. The grasslands? Not so much.

Thanks to the release of a compelling documentary highlighting the surprising hero that's helping to protect the grasslands ecosystem, eyes are being opened and misconceptions countered as we see the positive role agriculture plays in a sustainable and thriving grasslands ecosystem. Based in rural Alberta, the film, *Guardians of the Grasslands*, was produced by Ben Wilson and Sarah Wray, and supported by dedicated conservationists.

## Why the grasslands matter

The grasslands ecosystem contains wetlands, lakes, and rivers which support fish and waterfowl, and provide habitats for millions of migratory birds that stop to rest, nest, and feed. The grasslands support wildlife and the people and communities who rely on the land. Grasslands are critical in allowing water to infiltrate the ground, which in turn ensures healthy rivers and streams.

We often think of our forests as great storehouses of carbon, but Canada's grasslands act as one of the world's most stable carbon sinks by absorbing greenhouse gas (GHG) emissions and storing much of the carbon in the soil. According to some estimates, Canada's grasslands and pastures store up to 1.5 billion tons of carbon, which is equal to the emissions from 3.6 million cars annually.

Canada has already lost 74 percent of its grasslands and the remaining land is home to 60 at-risk species. We can't afford to lose more.

## Grasslands need grazers

Millions of bison once roamed Canada's grasslands, shaping the ecosystem and providing immense environmental benefit. Over time, cattle replaced the bison and generations of sustainable ranching have helped nourish and

sustain the ecosystem. Sometimes we make decisions without considering the impact. This is what happened when Grasslands National Park was established in the 1970s. The cattle were removed from the park, and without any grazers, invasive plant species became rooted in the land, leading to the disappearance of large numbers of birds. Cattle and bison have since been reintroduced to restore the ecosystem.

## Research helps discover the facts

While questions about water use and GHG emissions in the agriculture sector dominate the headlines, the history of Grasslands National Park has taught us the need to consider our decisions holistically. According to the Government of Canada statistics on GHG emissions, Canada's beef cattle account for only 2.4 percent of the country's total emissions. The reality is that cattle contribute to a thriving environment. They're natural fertilizers, returning protein-rich nutrients to the land. Removing them from the ecosystem can have negative consequences.

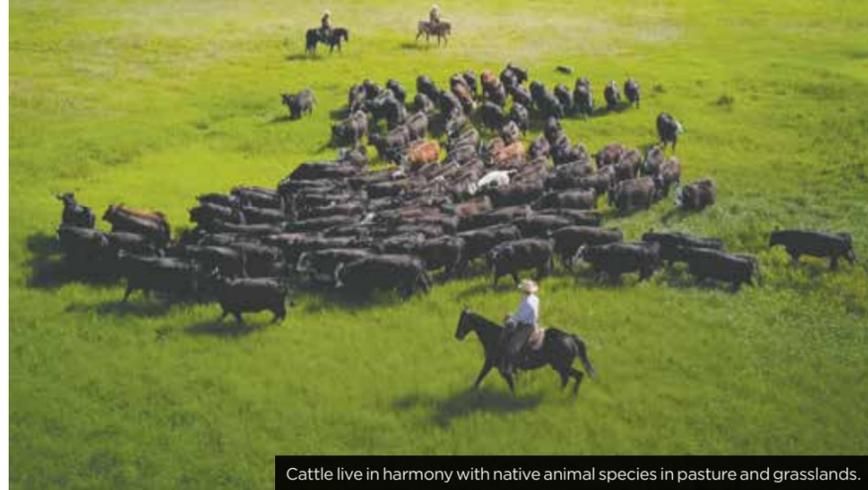
In addition, cattle can graze on marginal land that isn't suitable for human food production, and they live in harmony with other animals. While there isn't the data yet to suggest that cattle are carbon-neutral, there's more in their favour than ever gets considered. They're a tool to combat climate change.

It might sound radical to some, but cattle are the heroes that can keep our environment healthy and sustainable. This is going to become especially important as climate change increases the risk of forest fires, which cause carbon to be released into the atmosphere. In contrast, when grasslands burn, most of the carbon stays stored beneath the ground in the roots.

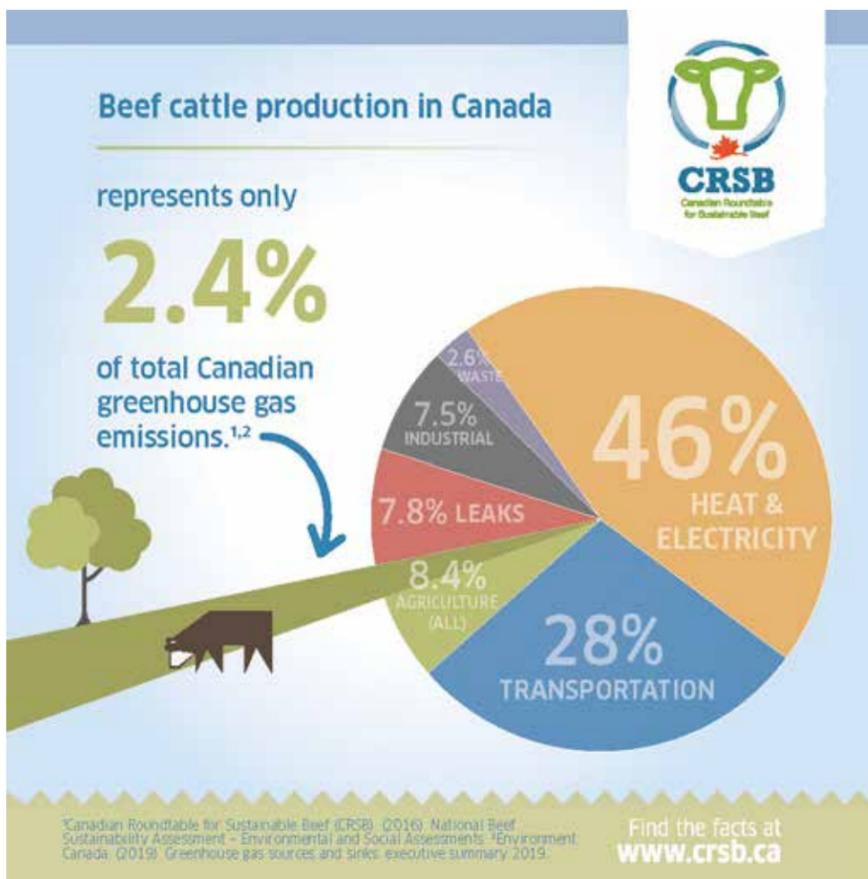
Sometimes what you thought was the problem is the solution. This is the provocative message the makers of *Guardians of the Grasslands* want people to think about. ●

Ken Donohue

To learn more about the film and to arrange a screening, visit [guardiansofthegrasslands.ca](http://guardiansofthegrasslands.ca)



Cattle live in harmony with native animal species in pasture and grasslands.



## Cattle Farmers and Conservationists Combine Forces



**Kristine Tapley**  
Regional Agrologist, Beef Industry,  
Ducks Unlimited Canada

The Canadian Prairies, known primarily for cattle ranches, feature incredible bio-diversity and are home to more than 60 native at-risk species. The 2,000 km valley of plains, forests, and farmlands is also one of the world's most stable carbon sinks.

But ranches are disappearing and we've already lost 74 percent of the Canadian grasslands to farming and development. Even with an investment of billions of dollars, they would take hundreds of years to regenerate, making it critical that we maintain the grasslands that remain.

## Grass grazers are necessary

"Our native ecosystem is largely prairies and requires a grazing presence to flourish," says Kristine Tapley, Regional Agrologist for the Beef Industry at Ducks Unlimited Canada (DUC). "When we hear negative stories about beef farming in the media, it's often in a global context that misses the Canadian context."

## Ranchers and conservationists raising awareness

DUC has forged an alliance between cattle farmers and conservationists to raise awareness about the importance of the grasslands to our environment and the importance of cattle to the grasslands.

"The partnership is based on the fact that we have so much in common and share so many of the same goals," says Tapley, who raises beef cattle. "Working together brings us closer to our shared end goal. We all want to keep water and grass on the landscape."

## An important and symbiotic relationship

The beef industry relies on the grass landscape as part of its production cycle and the prairie ecosystem needs the impact of grazing in order to rejuvenate grass and plants. Removing the top level of grass also allows more sun to penetrate the soil. It's a necessary and symbiotic relationship.

"If we lose the beef industry we lose the grass that goes along with it," says Tapley. "It's really as simple as that." ●

Gavin Davidson

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## Canadian Cattle Stand on Guard for Our Grasslands



**Ben Wilson**  
Freelance Filmmaker,  
Story Brokers Media House



**Sarah Wray**  
Film Director,  
Story Brokers Media House

Everyone has heard of the Guardians of the Galaxy. But did you know there're another group of guardians — who do more chewing than shooting — protecting the Canadian grasslands?

*Guardians Of The Grasslands* is a short documentary exploring the current state of one of the world's most endangered ecosystems, the Great Plains grasslands, and the role that cattle play in its survival. The film, produced by a group of dedicated Canadian filmmakers, featuring passionate conservationists, and ranchers, reveals important truths we must face about humanity's relationship with the land and our food as we reach new critical levels in the loss of these iconic landscapes.

## Grasslands are nature's carbon sink

"The Canadian grasslands are really cool not just because of their incredible diversity of species, but because they collect carbon from the atmosphere and store it in both the plants and the roots," says Ben Wilson, one of the filmmakers.

"The grasslands act as a natural and extremely stable carbon sink," continues Sarah Wray, the film's director. "The carbon will remain there as long as the land is never tilled. It's really a special thing."

## Cattle an essential element of a healthy prairie

Coming from a cattle ranching family, Wray was familiar with the connection between beef farming and the grasslands before starting the project. But for Wilson, coming from a background in aerospace engineering, it was a real eye-opener.

"What was really special for me was that I grew up in this industry and had always known the role played by cattle in protecting our valuable grasslands, but had never known how endangered they were," says Wray.

## Working together towards a common goal

"A rainforest being cut down is a very visual thing, but what's happening in the grasslands is harder to grasp," says Wilson. "Thankfully, ranchers and conservationists are working together to achieve the shared and urgent goal of preserving what little is left of Canada's grasslands." ●

Gavin Davidson

Supported by



# Canada's Prairies Are Leaders in Sustainable Beef Farming

Over the last few years, with climate change being at the forefront of many Canadians' minds, consumers have increasingly raised concerns about how Western Canadian livestock producers raise animals. It may surprise many Canadians to know that the country's cattle producers are equally as concerned with issues of sustainability and animal welfare. That's why producers, scientists, economists, engineers, and more have come together to form the innovative University of Saskatchewan's Livestock and Forage Centre of Excellence.

"The University of Saskatchewan's Livestock and Forage Centre of Excellence (LFCE) is a unique complex that will model and research all aspects of the beef and cattle industries," says Dr. Bart Lardner (PhD), a professor in the Department of Animal and Poultry Science at the University of Saskatchewan's College of Agriculture and Bioresources.

"The objective of the LFCE is to pull multiple disciplines under one model, under one roof. For example, people in animal health, animal nutrition, animal breeding, foraging and grazing management, soil and water management, production economics, and more will build on a strong network of partnerships to improve beef cattle and forage production across Canada and internationally," says Dr. Lardner, who is also the Ministry of Agriculture Strategic Research Program (SRP) Chair in Cow-Calf and Forage Systems.

## The big picture

The one-of-a-kind facility, which opened last fall, is one of the largest and most comprehensive livestock research centres in the world. By bringing together experts from a wide variety of fields, producers will have access to contemporary, top-notch, well-rounded research that gives them

a complete picture of cattle production, notes Dr. Lardner.

"We won't just be dealing with how animals grow, but also the nutrient cycle, the soil and water dynamics, veterinary medicine, and more," he says. "Previously, these subjects were all studied as separate entities and now they'll all be under one roof in a collaborative way to provide real-world information to farmers that they can implement on their farms for the best, most sustainable results."

## Prairie's sustainable pastures

Not only are the country's Canadian Prairies the ideal location for the LFCE, they're also the perfect location for beef cattle production. Dr. Lardner notes that Western Canada has more than 28 million acres of native rangelands and approximately 15 million of those are in Saskatchewan.

"That land is pasture and forage, and we know that land removes greenhouse gases from the air and stores them in the soil," he says. "So, if we removed cows from the picture, we would put that land at risk for conversion back to other uses — uses that would release more greenhouse gases. Also, if we didn't have grazing or beef cattle production on those native rangelands, we'd see a buildup of fuel from the grasses, which would be a huge fire hazard for both rural and urban areas."

Dr. Lardner further emphasizes that it's in the producers' best interests to raise healthy, sustainable beef.

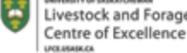
"Producers are probably the most sustainable folks that I know in this province," he says. "Their objective is to leave those resources in better condition for the next generation than when they took them over. Furthermore, it's important to understand that Canadian beef production accounts for only 0.04 percent of global greenhouse

gas emissions, which is only 2.4 percent of Canada's greenhouse gas emissions."

In fact, one of the main goals of the LFCE is to figure out how to develop eco-friendly farming.

"We're always looking at new opportunities with cattle management," Dr. Lardner says. "Are there ways to improve the cows' diet quality to reduce emissions? Different rotation management systems or forage combinations that we can use that will capture more carbon? Sustainable farming is in everyone's best interest."

Sandra MacGregor

Sponsored by 



**Dr. Bart Lardner**  
Professor,  
Department of Animal & Poultry Science,  
College of Agriculture & Bioresources,  
University of Saskatchewan &  
Ministry of Agriculture Strategic Research Program (SRP) Chair in Cow-Calf & Forage Systems

“If we removed cows from the picture, we would put that land at risk for conversion back to other uses — uses that would release more greenhouse gases.”

# Cleanfarms Credits Industry for Achievements in Ag Waste Recycling



**Barry Friesen**  
General Manager,  
Cleanfarms

With a decade of experience developing high-performing programs for the Canadian agricultural community that recover farm plastic packaging and other types of non-organic ag-waste for recycling or proper disposal, Cleanfarms is stepping up to take on one of its most ambitious years yet. It's a feat made possible for the non-profit industry stewardship organization by the support and leadership of its members.

"Long before most governments in Canada moved to regulate brand owners to take financial and operational responsibility for their used products and packaging, the crop protection industry had stepped forward voluntarily," says Cleanfarms General Manager Barry Friesen. "At the time, it was unprecedented in the Canadian stewardship arena — and it's still leading-edge."

The roots of packaging stewardship in agriculture stretch back to 1989, when the crop protection industry started a program to collect empty agricultural plastic jugs for recycling in Alberta. When it was clear the program needed to be expanded, the industry created Cleanfarms in 2010 to take it on. Now, it's a national program. Approximately 126 million empty plastic jugs have been recycled into farm products like drainage tiles instead of being disposed in landfills.

Constantly evolving, Cleanfarms operates collection programs for a broad range of farm

ag-waste materials, including:

- Empty pesticide and fertilizer jugs for recycling;
- Empty large, non-deposit, bulk pesticide and fertilizer containers for recycling;
- Unwanted and obsolete pesticides and livestock/equine medications for secure disposal (this program is operated in cooperation with the Canadian Animal Health Institute);
- Seed and pesticide bags for proper disposal (currently operating in Eastern Canada, with pilot programs in the Prairies);
- Grain bags for recycling in Saskatchewan;
- Grain bags and twine for recycling (pilot project) in Alberta; and
- Grain bags, silage/bale wrap, and twine for recycling (pilot projects) in Manitoba and Quebec.

"What's clear is that without the whole industry working with ag-retailers and farmers to manage ag waste, particularly plastic, toward a common goal of zero waste, the successes achieved by Cleanfarms wouldn't have been realized," says Friesen. "The next chapters in Cleanfarms' operational development will be to address ag-waste recovery and recycling in the horticulture, beef, and dairy sectors, where the low-hanging fruit — silage wrap, twine, netting, and greenhouse plastics — will expand opportunities to address all agricultural waste in Canada."

It's an aggressive agenda but Cleanfarms and its industry members know that environmental sustainability and clean farm communities depend on it.

Barbara McConnell



CONTRIBUTING TO  
**CLEANER FARM COMMUNITIES**  
in Canada

Thanks to our member companies, Cleanfarms is helping Canadian farmers contribute to a healthier environment and a sustainable future in their communities.

Cleanfarms is a leader in agricultural recycling. We develop, implement and operate programs to safely dispose or recycle agricultural plastics and products.

## Cleanfarms' Members



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