AGRICULTURE IN THE CLASSROOM CANADA

connectAG

PIECING TOGETHER OUR FOOD STORY

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connectAG – Piecing Together Our Food Story (Pilot 2018)

This pilot activity invites students in Grades 7 to 9 to explore Canadian agriculture by introducing them to farmers from 8 Canadian provinces, each representing a different commodity. In this activity, through reading the farmer profile, each student becomes their farmer and shares their story with the rest of the class so that all students get a national perspective. Understanding where and how our food is produced and the opportunities and challenges our producers face is explored through a series of discussion-prompting questions. This activity is aimed at engaging students – our future consumers and farmers – in order to enhance their knowledge, understanding, and appreciation of agriculture and food, and provide them with a connection to the Canadian agriculture industry.

Acknowledgements

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Growing Forward 2 Canada connectAG

Contents

Teacher Information and Activity Outline

Learning Objectives of connectAG – Piecing Together Our Food Story

- For students to learn more about where their food comes from and who produces it through the portrayal of real stories by real Canadian farmers.
- For students to learn about farming in each province and what makes each province unique.
- For students to make connections between different types of Canadian farms and farmers, exploring both their differences and similarities.

Outcomes

Farming is both a business and way of life, and while no two farms are alike, each with their own unique challenges and opportunities, our farmers across the country have a lot in common. Canadian farmers are hard-working, dedicated, passionate, and educated individuals, and they are part of families who work incredibly hard each day to produce our food.

How to Use Piecing Together Our Food Story in the Classroom

Recommended Grade Level: Grades 7 to 9
Subjects: Social Studies, Geography (Human)

Cross-curricular Competencies: To come after the pilot (all provinces will be represented, and provinces will also provide curriculum links).

Suggested Time

Minimum 75 minutes (the activity can be adjusted to your available time). A minimum of one 75-minute period would be necessary for students to complete the basic details. There is opportunity to expand the activity by introducing the additional discussion questions.

Materials

Farmer Profiles (8 farmers/provinces)
Farm Factors Sheets (8 in total – 1 per profile)
Student Worksheet (general)
connectAG Glossary (1 per group)

Activity

1. Print Farmer Profiles, Farm Factors Sheets, and Glossary for each student group.
2. Hand out the student worksheet to be filled out as the activity progresses, or hand the worksheet out at the end of the activity.
3. Divide the class into 8 groups (number of students per group will depend on classroom size), and give each group a Farmer Profile and corresponding Factors Sheet. One student in each group should be selected to briefly describe their farmer to the whole class.

   Note: If you have a small class, you don't have to use all 8 Farm Profiles and Factors Sheets (omit some farmers/provinces from the activity).
4. On the Factors Sheets, move through the five factors one at a time. Instruct the group to read each of the factors quietly as a group and reflect on the issues outlined (allow about 5 minutes per factor).
5. Once all the groups have read and reflected on their Farmer Profile and factors, guide them through the factors by asking the corresponding questions. The first few questions can be answered with a show of hands (yes/no answers), using information found in each Farmer Profile. These lead to subsequent questions that delve more deeply into the commodities and general farming using information in their Factors Sheets and require more thought and discussion. Allow for some discussion time within each group, as needed, before they share their answers with the class. While there are a number of questions provided per factor, you may want to limit the ones you use based on time and class composition (choose those areas you want to focus discussion on to help fit into your curriculum and learning objectives). Once the full class discussion of the first factor is finished, have the students read the next factor in their small group and repeat with subsequent factors.
6. After completing the five factors, ask students to fill out the Student Worksheet and reflect on the information presented, not just in their group but with the entire class.

Suggested Factor and Challenges Questions:

Factor 1 - LAND & ENVIRONMENT

Definition for teacher: *The physical factors, including land base, soil, relief, topography, climate, water, and growing season. Environment is the natural world, as a whole or in a particular geographical area, especially as affected by human activity.*

1. Does climate have an impact on decisions and practices on your farm?
2. Has the landscape and environment of your province influenced your farming decisions and practices?
3. Is your commodity seasonal? If a growing season was suddenly cut short, would your business be affected?
4. Is soil health important to you? Is management of soil health important to your business on both a short-term and long-term basis?
5. **Do you practice crop rotation? How does crop rotation help the soil? (discussion)**
6. **What else can farmers do to maintain or improve the soil health of their land? (discussion)**
7. **How does crop rotation help Canadian farmers in the long term? (discussion)**
8. **How would severe weather and climate change impact your farm? How does climate change impact agriculture in Canada? What measures can farmers take to prepare for and minimize the effects of extreme weather, such as flooding or drought? (discussion)**

Factor 2 - TECHNOLOGY

Definition for teacher: *Farmers may still watch the weather forecasts with great anticipation, but there's more to success than the right amounts of sun, rain, and luck. Most farmers now rely on technology to help them tackle pests and achieve greater yields. From GPS technology and combines that steer themselves to automatic milking systems, technology is driving farming into the future.*

1. Do you use technology? If yes, how does technology impact your business practices?
2. Do you use technology to connect with your community, share information about your farm practices and product, or foster the farm/food connection?
3. Do you want to focus on using more technology in the future?

Factor 2 - TECHNOLOGY cont'd

4. **In the early 1900's, tractors, which were considered a new technology at the time, replaced horses, oxen, and mules and revolutionized agriculture. Can you think of other technologies that have influenced farming, allowing farmers to increase production and feed and provide fuel for a growing population (i.e., plow, combine, fertilizer, GMOs)? Can you think of how these other technologies might directly benefit your farm? (discussion)**

5. **Do you use GPS technology? How does satellite imagery help farmers make better decisions? (discussion)**

6. **What are some examples of new technologies that can help farmers be more economically sustainable? (discussion)**

Factor 3 - MARKETS

Definition for teacher: *A demand – the business or trade, for a particular commodity or service. The people who might want to buy something, or a part of the world where something is sold. The market for a product is made up of existing and potential customers who need it and have the ability and willingness to pay for it. A place where buyers and sellers interact to trade goods or services.*

1. Is your farm close to a market? Does being close to an urban centre affect your business decisions?

2. Do you sell your product to a food processor? Or, do you grow and sell a whole product direct to retailers?

3. Do you sell your product outside of your province? Do you export your product to international markets?

4. Do rising food prices affect you (positive or negative)? Would a global change in food prices impact your product?

5. Are there costs associated with getting your product to market?

6. **Are there government bodies that facilitate the sale of or regulate your product? What impact do they have on Canadian farmers? (discussion)**

7. **What do you think is the impact of rising food prices on Canadian farmers? What if food prices were to decrease? (discussion)**

8. **If local markets suddenly stopped buying your product, how would it affect your operation? (discussion)**

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

Definition for teacher: *The goal of sustainable agriculture is to meet our food and textile needs in the present without compromising the ability of future generations to meet their own needs. Practitioners of sustainable agriculture seek to integrate three main objectives into their work: a healthy environment, economic profitability, and social and economic equity. Every person involved in the food system – growers, food processors, distributors, retailers, consumers, and waste managers – can play a role in ensuring a sustainable agricultural system. In agriculture, sustainability is a complex idea with many facets, including the economic (a sustainable farm should be a profitable business), the social (it should deal fairly with its workers and have a mutually beneficial relationship with the surrounding community), and the environmental (which means good stewardship of the natural systems and resources that farms rely on). This involves:*

- Building and maintaining healthy soil
- Managing water wisely
- Minimizing air, water, and climate pollution
- Promoting biodiversity

1. Which of you owns his or her land? How many also rent land?

2. Does the amount of land a farmer owns affect their farming practices?

3. Do you have employees? Would increasing labour costs affect your operation?

4. Would rising energy costs, such as an increase in costs of electricity and heating, affect your business?

5. **How would an increase in land costs affect you? What factors contribute to increases or decreases in the cost of farmland? (discussion)**

6. **Aside from land, what other costs significantly affect you (i.e., labour, equipment, feed, energy, transportation, fuel)? How can farmers best manage cost increases? (discussion)**

7. **What measures can farmers take to offset rising energy costs, such as fuel and electricity? (discussion)**

8. **Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. Do you have sustainable agriculture measures in place? Can you think of any other sustainable practices for your farm, or for farming in general? (discussion)**

9. **How would the loss of family farms affect all Canadians? (discussion)**

Factor 5 - HUMAN: FAMILY, LEGACY, & COMMUNITY

1. Is your farm a family-run operation?
2. Do you have a succession plan?
3. Are there government regulations and guidelines in place that affect you or your commodity?
4. Do food safety issues affect your commodity? Do you take steps to ensure that you are producing the safest food possible for the market?
5. Did you receive a formal agriculture education? Did you build your business through earning outside income?
6. Do you connect with other farmers to share knowledge and experiences?
7. **Is having a connection or dialogue with consumers and the community important to you as a farmer? Why do you think it's important for farmers to tell their story? (discussion)**
8. **What are some ways farmers can connect with each other and more directly with their community? (discussion)**
9. **What ways can young people enter into agriculture as a career? What are some of the barriers? (discussion)**
10. **What are some skills or attributes that contribute to being a successful farmer? (discussion)**

Farmer Profiles

British Columbia

CANADA'S WESTERNMOST PROVINCE is defined by its Pacific coastline and mountain ranges.

98% OF BC's FARMS are family owned and operated.

ABOUT 50% of the foods British Columbians eat are grown locally in the province.

BC IS THE THIRD LARGEST producer of cranberries in the world.

BC FARMERS GROW almost the entire annual Canadian production of raspberries.

AMOUNT OF HERBICIDES used in BC greenhouses: none.

#westernredcedar #spiritbear #eatlocal #mountains

"There are so many misconceptions about growing practices and the quality of food, and I want youth to know that farmers care about their health and that we grow food with passion and care."

MEET A BRITISH COLUMBIA GREENHOUSE VEGETABLE GROWER

Ravi and Gurinder Cheema, Creekside Hothouses Ltd.
Surrey & Abbotsford, British Columbia

OUR COMMODITIES: Bell Peppers, Eggplants, Tomatoes

OUR LAND BASE: 15 acres of greenhouses

OUR FARMING ROOTS

My family has been farming for many generations in India, and my father began farming in BC in the 1970's. I grew up on the farm and can remember being out on the fields when I was just four years old. Our entire family worked on the farm, and we grew broccoli, cauliflower, sprouts, strawberries, and blueberries for over two decades. When I was in my early twenties, I wanted to try something new, so I entered the greenhouse industry by buying a small, older facility of 2.5 acres in Abbotsford, which is in the Fraser Valley – a flat, fertile farming area east of Vancouver. Over the years, I was able to expand to 15 acres, and we are still growing, adding another 5 acres of greenhouses. I have worked on applying my fourth generation expertise in agriculture to focus on ways of continually improving the taste and quality of our food products, as well as looking for new seed varieties. My parents gave me the experience and a strong work ethic needed to run a farm, and I was helped along the way by the support of my wife, Gurinder, and our shared passion for agriculture.

OUR FARM TODAY

I am the current owner and CEO of Creekside Hothouses, and I oversee all major aspects of the business, including staffing, growing, marketing, finances, and much more. I am also very involved in various other organizations in the farming industry that help support our farming community. Gurinder is the executive director of the farm and is in charge of hiring and training new staff, executing food safety regulations, and various administrative tasks. My head growers assist me with growing each of the crops within the

greenhouses and planning future seasons. By growing our crops in greenhouses, not only do we extend our growing season to 10 months of the year, we can grow 10 to 20 times the amount of vegetables in the same area as a field – a result that feeds more Canadians.

We use many practises to make our farm more sustainable. For example, we grow our plants in rockwool and biodegradable material such as sawdust and coconut fiber. We feed the plants water and nutrients directly onto their roots, rather than on their leaves or other parts of the soil. Growing hydroponically means we feed our plants only as much nutrients as they need for optimum growth. We also use new water and heat conservation technologies. For example, we collect and recycle rainwater to use instead of groundwater, and we are able to store heat to use on cooler nights to minimize electricity use. We also use Integrated Pest Management, which is an ecosystem-based strategy for managing pests in an effective, economical, and environmentally sound way. For example, instead of using pesticides, we can choose to use good bugs, such as ladybugs, to fight bad crop-eating bugs.

My history as an outdoor farmer allows me to really appreciate the greenhouse setting. I spent many years early of my life working on the fields harvesting blueberries and strawberries in the summer, and broccoli and Brussels sprouts in the fall and winter. There's nothing like walking into a warm, clean greenhouse every morning, surrounded by the sweet smell of tomatoes. This is the feeling I get every time I go to work, despite what the weather is like outside. In a greenhouse, I know exactly what temperature it will be as soon as I walk in!

We currently sell our products in local grocery stores, such as Costco, Real Canadian Superstore, and Thrifty Foods, as well as serve the local community from our roadside stand.

FARMING FOR THE FUTURE

In the future, I hope to expand the area of our farm, and I want to see my products on even more local store shelves. I hope to pass the farm on to my children one day and continue the family legacy of farming. I stay in agriculture because I love educating the public about farming and food safety measures, and supporting local organizations.

Alberta

ALBERTA IS THE WESTERNMOST of Canada's three Prairie provinces, sharing many physical features with its two neighbours to the east.

WITH THE ROCKY MOUNTAINS, dry grasslands and the boreal forest, the landscape is diverse, as is its agriculture industry.

HOME TO THE OIL SANDS and vast amounts of natural gas and coal, Alberta is Canada's foremost energy-resource province.

ALBERTA IS A MAJOR GRAIN PRODUCER and top exporter of wheat, canola seed, beef, live cattle, and pork.

WITH GENTLY ROLLING HILLS and vast rangelands, Alberta is true cowboy country.

#oilsands #calgarystampede #rockymountains #dinosaur

"Farmers want what is best for the land and care deeply about our animals and their health. I would never sell anything for you to eat that I wouldn't eat myself or serve to my own family."

MEET AN ALBERTA FARMER

Adrienne Herron, Herron Farms
Pine Lake, Alberta

OUR COMMODITIES: Cattle

OUR LAND BASE: Quarter section (160 acres) owned, with some land rented

OUR FARMING ROOTS

I bought my cattle ranch, located in Central Alberta, in 2007, when I was in my late twenties. I have a Master of Science degree in Animal Behaviour and a Bachelor of Science degree in Sustainable Agricultural Systems from the University of Alberta. My maternal grandfather ran cattle just outside of Williams Lake, BC, and my dad's side of the family imported cattle and horses from their homeland of Ireland, so this wasn't my first experience in agriculture. When I first purchased this land it was overgrazed and weedy, and I could see that it had been badly mismanaged. I had my work cut out for me. Over the past decade, I've worked on building up a strong herd of beef cattle. Starting out with just four orphaned calves, I've grown that to a herd of over 100 cows.

OUR FARM TODAY

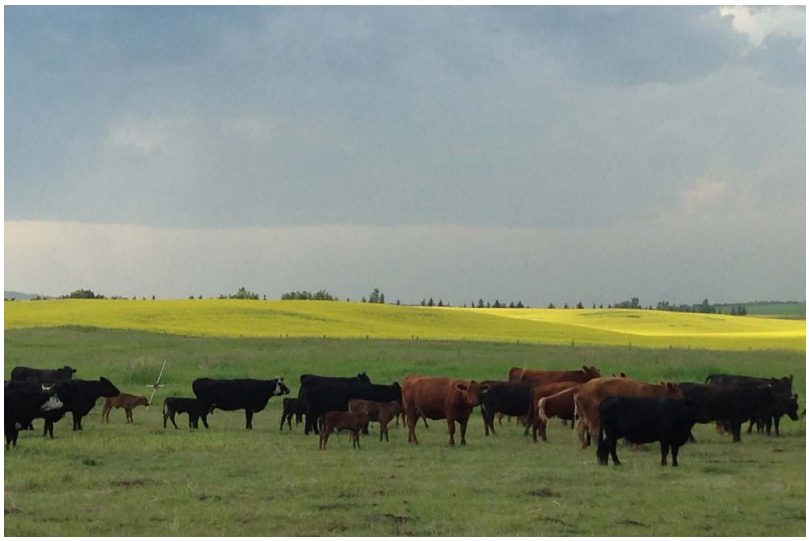
I am an independent owner-operator of my ranch. My friends and family appreciate the farming lifestyle and help out, especially during busy times. Without them, I'd never get a vacation! I raise a commercial herd to produce beef and a seedstock herd for breeding. For cattle to be called "seedstock," the breed must be specifically registered with a breed association with documented pedigrees and estimates of genetic merit. Our seedstock are Wagyu cattle, a Japanese breed known for their high-quality meat and physical endurance. "Wagyu" refers to all Japanese beef cattle, whereas "Wa" means "Japanese" and "gyu" means "cow." Our Wagyu cattle are sold as bulls and used for breeding. All of the Wagyu calves we produce are sold off of the ranch, mainly to Ontario. At one time, these sales required a ton of paperwork involving records of animal growth and traits (e.g., distribution of

fat, weight, and length), but now I have software with these details right at my fingertips on my cell phone. We still work cattle from horseback, but ranching and cattle breeding have evolved into a combination of traditional practices and new technologies, such as my cell phone software, bale grazing, and mobile electric fencing.

FARMING FOR THE FUTURE

My goal is to continue using holistic management techniques on the farm, which means using natural, regenerative practices to address issues such as soil health. Bale grazing is an example of a holistic practice. We line up the bales of hay for the cattle to feed on along electric fencing that we can move to different locations, creating mobile grazing areas. With mobile fencing, we steer the cattle to areas best suited to grazing so that manure and urine are deposited in a more even and controlled way, adding nutrients to the soil and increasing soil health. As the soil health improves, the food supported by that soil, such as grass, contains more minerals and nutrients, which also help our cattle to grow and be healthy. These practices help raise healthy livestock and produce healthier food, while also improving natural wildlife habitats.

Also, I knew the wetland areas of my land would be more productive in the long run if we put more work into them now. So I went to ALUS (Alternative Land Use Services) – a program in Alberta that compensates farmers for providing ecosystem services on their land – and they gave me some money to fence off some of the wetland areas. While this wetland is on my private land, it serves a public good too. By not running my cattle in the creek or overgrazing fragile areas, I'm preserving this delicate ecosystem. I want to keep thinking of new ways to protect and improve our land, not just for myself, but for the greater community.



One of my biggest challenges is balancing the welfare of our livestock and profitability. I grapple with those decisions every day and live with the consequences of my choices. I would like to look at adding farm gate sales of beef to my business model, which would benefit the local community and contribute to local food production.

Being a farmer is very intense – my absolute best and worst moments have been on my ranch. I've had uplifting successes where I've solved a real crisis, then devastating moments where, for example, I lose an animal. But overcoming challenges and seeing healthy animals and positive changes in the land is so rewarding that I would never trade the highs and lows of being a farmer. It's an amazing way of life – and I get to ride horses every day as part of my job!

Saskatchewan

ONE OF CANADA'S THREE Prairie provinces, Saskatchewan has few urban centres and plenty of space for farming on a large scale.

KNOWN AS CANADA'S BREADBASKET, Saskatchewan has large areas of flat to gently rolling land, ideal for growing wheat, canola, and other grains.

OVER 6 MILLION hectares of fertile pastureland and high-quality feed for ranchers make it the second largest beef producer in Canada (hint: first is their neighbour to the west).

FERTILE SOIL, land, and water resources are ideal for farming a variety of high-quality grains, fruits, and vegetables. 65% of the world's lentils are grown in Canada, mainly in Saskatchewan.

LIKE EATING HUMMUS? Thank a Saskatchewan farmer – they produce 99% of Canada's chickpeas.

#landofthelivingskies #canadasgrainbelt #chickpeas

"We are stewards of the land and take pride in everything we grow. Our goal is to make a good living while producing a high-quality food in the most sustainable way possible. We want to leave the land in better shape than we found it so that future generations can continue our legacy."

MEET A SASKATCHEWAN GRAIN FARMER

Trevor and Michelle Scherman,
T. Scherman Acres Ltd.
Battleford, Saskatchewan

OUR COMMODITIES: Wheat, Canola, Lentils, Peas

OUR LAND BASE: 2,220 acres owned, 3,300 acres rented

OUR FARMING ROOTS

My grandfather immigrated from Austria in the late 1920's with only $24 in his pocket. He landed on the East Coast near Halifax and worked his way west in search of good farmland, eventually purchasing his own land in northwest Saskatchewan, where he settled into farming and raising a family. My father and his two brothers farmed the land, raising cattle and growing grain. I grew up on our family farm, and later I studied Agriculture at the University of Saskatchewan.

I purchased my own land in 2001 at an unlucky time – during the last major drought in the Prairies. These were tough times for prairie farmers, and like many, I took on a full-time job with an agricultural business to pay off my debt and keep the farm. Over the years, I gradually built up my farm to 2,200 acres. As part of my dad's succession plan, I farm his land and will eventually purchase it from him, but for now, I'm fully responsible for farming 5,500 acres.

OUR FARM TODAY

My wife Michelle and I run the farm together; she has a degree in Agricultural Economics, so we make a great team. My parents are still pretty involved in the daily running of the farm. My kids are fourth generation prairie farmers and have been helping out since they were 10 – just like I did on my parents' farm. I also have a full-time hired man who came to Canada from the Ukraine as an exchange student. During harvest, which is our busiest time of the year, I hire a few extra people to help out.

Fifty-five hundred acres is a lot of land – imagine over 5,000 football fields joined together! Managing a farm that size takes a lot of efficiency. We plant a variety of crops based on long experience of what grows well on our land and market demands. To help us manage the different needs of these crops, we use technology specific to agriculture that enables us to vary the rate of crops we plant and shows us exactly what, when, and where to plant them. Using satellite imagery, we've divided each of our fields into zones showing different areas of growing potential.

We test the soil and create a growing plan specific to each zone. Our zone plan tells us how much seed and fertilizer are needed, grid square by grid square. That way, we don't waste any expensive fertilizer. We also use drones, weather data, and equipment data collection to assess the effectiveness of our operation and make improvements. I use an app on my cell phone created by a company called Farmers Edge, which gives me access to a ton of information – it even gathers data from three weather stations right on our property and lets me know if there's wind headed our way that might disrupt our work. Now I know if I'm going spraying at four in the morning or if I can go to my son's ball game that day. I also use it for administrative tasks, like scheduling my hired hands and tracking my finances, giving me more time to be out in the fields.

FARMING FOR THE FUTURE

My future plans include more growth of the farm. We are also always striving to be more sustainable and working to find new technologies to help us produce as much as we can with our existing land base. Our goal has always been to allow our children – and hopefully our grandchildren – to carry on what their great-grandfather started, and to carry on our family legacy.

I am motivated to be a farmer because of the many opportunities for improving our operation, and the satisfaction I get from running my own business, yet I never confuse having a career with having a life. Every year, we try to do better than the year before, and we are constantly learning and adapting to new technology. Our motto is: "We make the best decision with the information we have at that time."

Manitoba

THIS PRAIRIE PROVINCE in the heart of Canada has a large agricultural sector, particularly in the southern Boreal Plains.

MANITOBA'S TOP COMMODITIES are hogs, grains, and oil seeds.

THERE ARE MORE than 100,000 lakes in Manitoba and two-fifths of the province's land area is forested.

THE RED RIVER, which runs north through Southern Manitoba and into Lake Winnipeg, flows through a temperate grassland region, much of which has been converted for agricultural purposes.

#polarbearcapital #auroraborealis #floodofthecentury

"We strongly believe in sustainability and care about our animals and the soil, and we know that if we didn't have respect for our land, we wouldn't have a future."

MEET A MANITOBA MIXED FARMER

Will Bergmann, Bergmann Bros.
Glenlea, Manitoba

OUR COMMODITIES: 3,000 Pigs, Wheat, Oats, Canola, Soybeans, Corn

OUR LAND BASE: Less than 3,000 acres owned

OUR FARMING ROOTS

The Bergmann Bros. farm has been in my family since 1925 and was started by my grandfather and great-uncle after they emigrated from the Ukraine. It is nestled alongside the Red River, just south of Winnipeg. The Red River Valley is a unique and historically rich agricultural area that was originally farmed by First Nations peoples, then by early settlers. It can be tough going, as the valley is prone to both drought and severe flooding, especially during the spring snow melts and river ice break-ups. I am one of three out of six kids who decided to continue farming when I grew up. In 2011, my oldest uncle retired and I bought his share, and now I farm with my father, Rudy, and Uncle Eric. We split our time between raising hogs and growing grain and vegetables. We also used to have a dairy operation, but sold it in 1996 so we could focus more on our hog business.

OUR FARM TODAY

My father, Uncle Eric, and I share equal responsibility for all aspects of the operation, but we each have our own area of expertise – pigs, grains, and vegetables. As mixed farmers, we grow things based on business decisions: what's selling in the market, and crop rotation. It's important to switch up what you grow in your fields to maintain healthy nutrients in your soil. A farm is only as good as its soil. We grow organic vegetables because they fulfill a local need for fresh, seasonal produce in the market. Our grain is sold to any of five local grain buyers. Our pigs are contracted through HyLife, Canada's leading pork producer and global exporter, based here in Manitoba, who then sells them overseas. Like us, they are committed to only selling the highest quality pork products. There's a lot to keep track of on a large farm, and technology definitely makes my job easier. I use GPS guidance technology to

help map out our fields, and to show me where to place our seeds and fertilizer. I used to spend a lot of time out in the fields scouting and checking my crops, but now I can use a drone to take pictures and videos that I can check from my computer.

I'm passionate about having farm-to-food conversations that come from direct contact with consumers. That's why I started growing vegetables in a community garden a few years ago. None of my friends are farmers; they know me as someone who they surf and play music with, and they kept asking me, "What do you do all day?" So, I started to share my story. I like to show people what it means to be a modern farmer, and through my blog and social media platforms, I try to bridge some of the disconnect people have in terms of where their food comes from. I want to paint a picture of what's really happening on the farm. There are people with all kinds of beliefs and feelings about agriculture-related issues. I want them to make their own decisions after seeing and hearing more of the real story of modern agriculture. I consider myself an "agvocate." Being a strong agvocate means listening first and talking second. People are turned off if I try to force my opinions on them. I share who I am, what I do, and what I believe. I use Twitter and Instagram to share images and stories of the farm life, and I also share my passion of music and photography. I even created a video using a drone called "Welcome to the Farm," which shows a bird's-eye view of four seasons on our grain farm.

FARMING FOR THE FUTURE

In a few years, my Uncle Eric and then my father will retire, and I will be on my own to run the family business, but my wife will help, and I have three young children, who we hope will become involved in farming as well. I would like to see a transition away from mainly pig farming, but it is a tough commodity to give up, because it's such a good source of income. I would also like to build greenhouses so that we can grow more organic vegetables.

Farming allows me to work outside and be my own boss. The sights, sounds, and smells around me, sunrises and sunsets – the beauty I see around me every day, even after all the hard work, makes it all worthwhile. I take great pride in feeding people quality foods, both locally and overseas. Farmers have a lot of hope. We expect that certain things will happen, but ultimately, we don't know what will come about, so we hope. I might be different than other farmers, because I feel that there is some sort of comfort in hope – in knowing that we don't have complete control.

Ontario

ONTARIO IS CANADA'S SECOND largest province, covering more than 1 million square kilometres – that's larger than France and Spain combined.

ONTARIO'S VARIED LANDSCAPE includes the vast, rocky, and mineral-rich Canadian Shield, grassy lowlands in the north and fertile farmland in the south – where you'll find 90% of the farms.

DAIRY FARMING is one of the largest agricultural sectors in Canada, with Ontario and Quebec being the major dairy producing provinces.

THE NAME ONTARIO comes from an Iroquois word for "beautiful water, beautiful lake, or big body of water."

#capitalcityottawa #greatlakes #goldenhorseshoe

"Farmers work hard and long hours to provide good quality and safe milk to drink and crops for food, and there are many rules in place to assure this happens. The stakes are high, and we take our livelihood very seriously. When you get a snow day at school or take a holiday, think about the farmer who goes to work 365 days a year to look after their animals and to produce crops so the world can eat!"

MEET AN ONTARIO DAIRY FARMER

Steve and Ed Bloetjes, Bloetjes Farms Ltd.
Dorchester, Ontario

OUR COMMODITIES: Dairy, Corn, Soybeans, Wheat, Hay, Straw

OUR LAND BASE: 600 acres owned, 600 acres rented

OUR FARMING ROOTS

Our father, Case Bloetjes, purchased 200 acres in Southwestern Ontario, just east of the city of London, in 1966 to start a dairy farm. He chose his location well – the geography and climate, along with its close proximity to growing urban centres, make this rural area one of Canada's richest farm belts. There's a long history of dairy farmers and cheesemakers in Middlesex County – most of Ontario's cheese production is located in this area too – and cheesemakers need a lot of milk. While historically, many farmers had dairy cows for their own milk consumption, it wasn't until the 60's that there were dedicated dairy farms like my father's. We grew up on the farm and knew at a very early age that we wanted to be dairy farmers. We took over the farm from our dad in 1980, and then in 2015, my brother Ed's son Kevin joined us as a partner. We're third generation farmers, so it's in our blood. Although we grew up farming, it didn't come easy to us. The farm got to be where it is today through years of hard work and dedication.

OUR FARM TODAY

Our farm is truly a family operation. Ed and I are both in our fifties. Ed manages the dairy herd with his son Randy, 23 while Kevin, 26 and I manage the field operations. My wife Chris also helps out with fieldwork. Our farm is both a dairy and cash crop operation. All of our milk is sold to the Ontario Milk Marketing Board, an intermediate body that buys all the milk produced on Ontario farms and sells it to processors locally and around the world. We currently have a herd of about 100 milking cows in production. Like most Ontario dairy farmers, we raise Holstein cows for milk production. It takes a lot of nutrients for a dairy cow to produce milk,

and feed is our biggest ongoing expense. Growing our own corn, soybeans, hay, and wheat for feed helps make our production more sustainable. Any extra corn is sold to an ethanol plant, a sugar plant, and local feed mills. Nothing is wasted. Even the straw, which is a by-product of our wheat harvest, is used for bedding for the cows.

Dairy farming has changed a lot since Dad started Bloetjes Farms in the 60's. Imagine running a business without a cell phone or a computer? Technology has driven agricultural innovations too. When we grew up, everything was done by hand, including the milking, but things have evolved. In 2014, a devastating fire ripped through our farm, destroying several barns. We were lucky; all but three of our 100 dairy cattle were rescued. After the fire, we rebuilt our barns and upgraded them with a robotic milking system. It was expensive, but our labour costs have gone down and production has increased. Now we can spend more time dedicated to individual cow and calf health, instead of time spent moving cows and running a milking parlour. It gives us more flexibility in our schedule, including more time to spend with our families. A robot doesn't run itself, though – these are machines, and like tractors, they need to be maintained.

FARMING FOR THE FUTURE

We will continue to make constant upgrades to our farm to keep up with new technology and make our operation as sustainable as possible. The robotic milking system has already changed our business. The data we collect provides us with tons of information about each cow – from udder health to infections, and even heat detection. We've recently started using GPS guidance technology to auto steer our tractors and field equipment and are seeing a marked improvement in our crop productivity. We aim to use new technology to manage all aspects of our operation and to grow and prosper as a family-run farm. Dairy farming is a way of life, with new challenges every day. There is a cycle of life on the farm that guides our lives, be it with the animals, or with the crops being planted every spring and harvested every fall.

Nova Scotia

ALMOST COMPLETELY SURROUNDED by the Atlantic Ocean, no point in this Maritime province is more than 60 kilometers from the sea.

MUCH OF NOVA SCOTIA has soil that is not suitable for agriculture, but the hardy wild lowbush blueberry is native to Eastern Canada and has grown naturally there for thousands of years.

THERE ARE ABOUT 40,000 ACRES of wild blueberries in Nova Scotia and about 1,000 wild blueberry growers.

NOVA SCOTIA LEADS Atlantic Canada in the number of acres devoted to growing apples.

#BayofFundy #lobster #CapeBreton #wildblueberries

"Young farmers are hard workers and take a lot of pride in delivering healthy foods to Canadian tables and tables around the world. Wild blueberries are one of the healthiest fruits in the world, and I am proud to be a part of that."

MEET A NOVA SCOTIA WILD BLUEBERRY FARMER

David & Katie Atkinson, D.R. Atkinson Farming Ltd.
Southampton, Nova Scotia

OUR COMMODITIES: Wild Blueberries

OUR LAND BASE: 605 acres owned

OUR FARMING ROOTS

Farming has been a part of my family for four generations. My great-grandfather started our farm in the late 1800's with 400 acres here in Cumberland County, which is located in northeastern Nova Scotia near the Bay of Fundy. There's a long history of wild blueberry farming in this region, and the soil and climate are ideal for it. My great-grandfather and grandfather produced wild blueberries, maple syrup, cattle, hay, and fruits and vegetables to both eat and sell. My dad was raised on the farm, became a land surveyor, then took over the farm in the late 50's, converting it to just wild blueberries and forest.

As a teenager, I didn't see farming as a career for me, so, being encouraged by educators, I went to university, where I studied engineering for a year, then in 1998, I switched to carpentry. That same year, my parents were ready to retire, and since I still had an interest in agriculture, I purchased the farm from them. The next year, I saved enough money for a down payment to buy my first tractor and a wild blueberry harvester. I worked for an excavating company for nine years while building my farm business and continued to expand by purchasing other farming equipment and growing to 605 acres. I was able to build the business up gradually by starting small, focussing on quality and diversity within the wild blueberry industry. My dad, in his eighties now, still lives on the farm and helps us with running errands.

Nova Scotia

OUR FARM TODAY

Nova Scotia's provincial berry, the wild blueberry, is a unique food crop. Because they're wild, they can't be planted or farmed like other crops. We manage sprout and crop fields on a two-year cycle, with half of the plants managed to encourage growth, while the other half is prepared for harvest.

A yearly look at our farm: in the spring and summer, we scout the fields and manage the plants where needed, use tractors and the excavator to level and expand our fields, do road maintenance, gather firewood for the year, and manage our tree lot for sustainable forestry. In July, we hook up mechanical harvesters to the tractors for the harvest in August. We deliver our berries each day to Oxford Frozen Foods for processing (keeping lots for our freezer at home!). After harvest, we do equipment maintenance, scout the fields, and mow harvested plants to the ground to promote growth. During the winter, there's some downtime to play hockey and spend time with family! Our fields produce 3,000 kg of berries per acre on average. One full-time employee helps us with the daily operations. We employ another six people during the harvesting season – three are students, who we pay higher wages than the industry average to encourage them to work hard for their future, while maybe considering farming as a career option. Our employees' success comes first – they're more important to our farm than having the latest piece of equipment.

FARMING FOR THE FUTURE

Our biggest challenge today is that the price for wild blueberries has dropped, and since that's not something we can control, we need to continue producing premium quality fruit and diversify. We plan to expand our wild blueberry business and continue our excavation services, and we hope to reopen our 40 acres of sugar bush to produce maple syrup again. I love being in agriculture because I get to be my own boss and have my family involved in the business. I hope to teach my daughters about farming, business planning, and having fun while they work. I hope they take over our farm, or start their own, but more importantly, I want them to be passionate about what they are doing. I try to show them, by example, that by taking pride in what you do, you'll succeed!

Prince Edward Island

CANADA'S SMALLEST PROVINCE, both in population and in land size, PEI accounts for only 0.1% of the total area of Canada, and less than 150,000 people live there.

AGRICULTURE IS PEI's largest industry, with nearly half of the land dedicated to farming.

POTATOES HAVE BEEN PRODUCED on PEI since as early as 1771.

PEI'S FAMOUS RED DIRT gets its colour from its high iron content, which oxidizes when exposed to air.

10 MILLION world-famous Malpeque oysters are harvested annually on Prince Edward Island.

#AnneofGreenGables #reddirt #birthplaceofconfederation

"Farmers care about what they do, and as the world population and demand for food grows, we will work tirelessly to improve our farm to provide safe and healthy food to feed the world."

MEET A PRINCE EDWARD ISLAND POTATO FARMER

Ray and Alvin Keenan, Rollo Bay Holdings Ltd.
Souris, Prince Edward Island

OUR COMMODITIES: Potatoes, Rotational Crops (Barley and Winter Wheat)

OUR LAND BASE: 3,000 acres, with 1,000 acres devoted to potatoes

OUR FARMING ROOTS

Potato farming is in our genes. We grew up in the 1950's and 60's on our family's potato farm in New Brunswick. In the late 60's, the provincial government purchased some of our land that was on a flood plain, enabling our father to buy excellent growing land in our neighbour province, Prince Edward Island. This was the beginning of Keenan PEI Potatoes. We purchased the operation from our father when he retired in 1982. We have always embraced new technology. Technological advancements, such as state-of-the-art field equipment and storage facilities, and a packing house with metal detectors, x-rays, and a computerized grading equipment, have allowed us to grow from our humble beginnings to a multi-thousand-acre farm.

OUR FARM TODAY

We have over 40 employees who plant, grow, harvest, store, package, and deliver some 40 million pounds of potatoes per year. While potatoes are our primary crop, we trade some of our fields with local grain farmers so that we can follow a three-year crop rotation. That means fields dedicated to growing potatoes in one cycle might be planted with barley or wheat in the next cycle. Keeping crops in rotation helps maintain soil structure and fertility, increases soil organic matter, and conserves soil moisture. It's the best way to help maintain the balance of nutrients, organic matter, and microorganisms necessary for healthy soil. Crop rotation also reduces the impact of pests and diseases –it breaks the pest cycle by providing a new crop that is not a host to that organism.

We employ people of all ages, and one of our employees has worked with us for over 50 years! We manage the day-to-day business of the farm together, but it takes a big team of skilled employees to keep this huge operation running smoothly, so we also have a packing house supervisor, a farm and field manager, as well as head equipment qualified service technicians, mechanics, and shipping and receiving and food safety employees.

Prince Edward Island

We ship the majority of our potatoes to Central and Atlantic Canada and the US, with some going to Western Canada. Some of our potatoes are then sold as table potatoes or processed into frozen potato products and chips. Our farm has grown to feed over 850,000 consumers each year! Potatoes are the fourth most consumed crop in the world, and for good reason – not only do they taste great, they have more potassium than a banana, and they're chock full of vitamin C.

As a way of connecting with our community, we also sell our potatoes in local grocery stores and from our roadside stand. This province has a rich farming heritage, and we're proud to be a part of it, and were especially proud of the product that we grow. Meeting our customers gives us the opportunity to talk to them about what we do, as well as further the farm-food connection.

FARMING FOR THE FUTURE

Both of us have family members who may eventually take over the farm. We want our operation to remain both within the family and with our dedicated employees, who helped build the business. We hope our farming legacy will not stop with us. Preparing the next generation for careers on the farm is a top priority. We also want to continue to produce a high-quality product, while dealing with sustainability issues, climate change, and environmental impact. New technology will help us achieve these goals. We take great pride in growing a quality, whole-food product, and we appreciate our family, employees, and the community that have helped us make our farm what it has become today. Growing and packing the highest quality potato crop contributes to the greater good, and at the same time, we are proud to be supporting our local economy and community through the jobs we create.

Newfoundland and Labrador

A LARGE ISLAND in the Atlantic Ocean, Newfoundland is the most easterly province of Canada.

TOGETHER WITH MAINLAND LABRADOR, it forms one of Canada's four Atlantic provinces.

A RUGGED LANDSCAPE with nearly 10,000 km of coastline, "The Rock" is also well suited to the fishing industry.

WILD BLUEBERRIES AND CLOUDBERRIES thrive in the barren regions of Newfoundland.

#therock #wildblueberries #cod #icebergs

"Farming isn't what you think it is until you experience it, and until you do, you won't know what you are missing! Agriculture is a great career opportunity, because people will always need food to eat."

MEET A NEWFOUNDLAND CHICKEN FARMER

Darryl Legge, Legges Poultry
Holyrood, Newfoundland

OUR COMMODITIES: Chickens

OUR LAND BASE: 30 acres owned

OUR FARMING ROOTS

With poor soil and a harsh climate, Newfoundland is a tough place to be a farmer. In the past, farming was just something fishermen did as a supplementary source of income, or for their own food.

My grandparents started our farm in the early 70's, raising chicken, hogs, and cattle. Like most Newfoundland farmers, they located close to St. John's, the capital city and most populated area of the province. In a province as rugged and sparsely populated as 'The Rock', it's essential for a farmer to be close to the market. After a few years, they decided to focus solely on chicken production. In the early 80's, my parents bought another chicken farm and then took over my grandparents' operation, increasing their production to six cycles a year, with 126,000 chickens per cycle! As a teenager, I didn't see myself spending my life on a farm, so I went away to university. Shortly after I graduated, I realized the importance of farming, the great lifestyle it offered, and the opportunities that were there for me, so I came back to it. When my parents retired, I took over the operation and never looked back.

OUR FARM TODAY

Legges Poultry currently consists of me and two full-time and six part-time employees. My role hasn't changed much since I bought the farm from my parents, and my daily routine consists of many different tasks. I operate heavy equipment, work in the barns, read and write reports, and deal with financial institutions and government agencies – the job is diverse, to say the least!

Newfoundland and Labrador

We operate two different locations with four different poultry barns. The barns are controlled by computers that regulate heating, ventilation, and lighting so that temperatures, humidity, and carbon dioxide levels are kept at constant levels. The computers alert us of changes in temperature, power and feed outages, or increases/decreases in water pressure. Each barn is heated with propane heaters specifically designed for chicken farming, with back-up power that automatically turns on in the event of a power outage – that's especially important during winter storms.

Our total barn space is around 7,500 square metres, and it requires a lot of light. We run over 600 LED lights at a time! Feeding our flocks has always been labour intensive and expensive. We now benefit from a relatively new invention: a mechanical feeder, which takes feed from a central hopper or bin out to the birds continuously. We even use a more reliable infrared technology (instead of a mechanical switch) in our feeding systems to ensure that our chickens never run out of food. Last year, we produced over 800,000 chickens – we go through a lot of feed.

The poultry we raise is sold to Country Ribbon, Newfoundland's only fully integrated chicken producer and processor. That means they're involved in every stage of the process, so we not only know where our product has been, we also know where it's going, from farm to plate.

FARMING FOR THE FUTURE

My future plans are to move the farm to a larger land base and to double production. I would also like to diversify into new commodities and, at the same time, work on making my farm more efficient with green technology and environmentally friendly practices.

I love the farming lifestyle. The freedom of operating as your own boss makes it an attractive profession to me. What you put into it is what you take out of it. You spend some time in the office, but then you have the opportunity to go outside and use your hands. It sure isn't boring.

"This is the frontier of agriculture in Canada. We are untouched, really, when you compare us to the rest of the country. So, we have the potential for this industry to grow in leaps and bounds."

Farm Factors Sheets

British Columbia Greenhouse Vegetable Growing

A farm is a puzzle made up of many different pieces.
Like a puzzle with pieces you can organize by size, shape, or colour,
the agriculture puzzle is made up of different factors, influences,
and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

BC is a land of diversity and contrasts. Its landscape – mountains, forests, coastal areas, and vast wilderness – limits agricultural production, where cultivated land constitutes only a tiny percentage of this province's large area.

About 60% of British Columbia is forested, accounting for approximately 19.5% of the forested land in Canada.

The average size of a BC farm is just over 300 acres.

Greenhouses – glass-enclosed structures – allow growers to create a controlled growing environment, in which they provide their crops with natural sunlight while protecting them from nature's harsher elements (wind, rain, frost, snow, pests, man-made harmful emissions). By controlling the light, heat, and humidity, greenhouse growers can extend summer to nearly 10 months. The Fraser Valley has a moderate climate that allows growers to maintain optimal regulated growing temperatures inside their greenhouses at a lower cost than controlled indoor growing environments elsewhere.

Although greenhouse farmers can regulate light, plants still need sunlight for photosynthesis. During the darkest months of the year – December and January – growers replace old plants with new ones to get ready for another growing season.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

Greenhouses provide an environment for growing plants that would not otherwise survive outside during the winter.

British Columbia's greenhouse sector is highly innovative. Greenhouse farmers look for new ways to reduce their environmental footprint via methods such as producing renewable energy, high efficiency heating systems, generating renewable heat, and conserving water. Some growers now collect condensation, rain, and irrigation run-off and recycle it for use in the greenhouse. Also, heat collected from solar thermal arrays and warehouse refrigeration exhaust can be stored and circulated.

Factor 3 - MARKETS

(Where the products are sold and how, and their prices.)

BC exports agricultural products, valued at over 2 billion dollars, to over 100 countries annually. The key export market for greenhouse-grown vegetables is the United States.

With increasing demand from consumers for local products, the BC greenhouse industry has steadily grown from 276 acres in 1997 to about 800 acres today. While farmers' fields may be covered in snow or mud throughout the winter, consumers can find greenhouse-grown tomatoes and cucumbers in grocery stores during the colder months of the year.

Consumers' demand for fresh produce year-round has traditionally meant importing products from other countries, but with greenhouse farms, customers can now buy more local BC produce throughout the year.

Factor 3 - MARKETS cont'd

Market prices for vegetables and fruits fluctuate and demands change, locally and around the world.

BC greenhouse growers stay competitive by growing different varieties of popular crops – tomatoes, cucumbers, sweet peppers, and eggplant (as well as limited quantities of strawberries).

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

Agriculture plays a very important role in BC's economy, and the industry employs many people – from trucking companies, equipment dealers, manufacturers, restaurant workers, and grocery stores to the farm workers themselves (it's a long and varied list!).

The balance between economic development and environmental protection is in the forefront in BC, whose economy relies greatly on renewable resources. While historically, many of the province's resources seemed inexhaustible, depleted coastal forests and threatened salmon fisheries have proved otherwise. Much of the valuable agricultural land in BC has also been lost to roads, urban development, and industry.

Recognizing that agricultural land is a finite and valuable resource, the BC government established the Agricultural Land Reserve (ALR), a provincial zone in which agriculture is recognized as the priority use, farming is encouraged, and non-agricultural uses are restricted. The ALR protects approximately 4.6 million hectares of agriculturally suitable land across the province.

Greenhouses allow farmers to grow a lot of produce in a relatively small amount of space using about one-tenth of the land space as field-grown produce. Greenhouse growing is sustainable, as it makes more efficient use of land and water than field farming.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy.

Family farming is the main form of farming and food production around the world. In Canada, approximately 97% of farms are family-owned and operated, and they are often handed down from generation to generation. From the very young to grandparents, sometimes four generations work together on one farm.

The skills a greenhouse farmer needs include being able to effectively communicate with workers, analyze the conditions of indoor growing environments, understanding and implementing new technologies. Primarily, farmers are trained through college certification programs, mentorship on the farm and through hands-on experience. However, many farmers study business and science in post-secondary school. New farmers can learn through apprenticeships on multiple farms or by being trained and mentored on a family farm.

Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in production.

The BC Greenhouse Growers' Association (BCGGA) is a non-profit organization that represents greenhouse farmers in British Columbia. The BCGGA delivers services that help keep the sector globally competitive while providing consumers with high-quality, sustainable, and safe greenhouse products.

"A greenhouse allows farmers to control the climate for their plants 24 hours a day, so they can grow strong, healthy, and big. Greenhouses mean farmers can grow more months of the year and make the most use of land."

Alberta Cattle Ranching

A farm is a puzzle made up of many different pieces. Like a puzzle with pieces you can organize by size, shape, or colour, the agriculture puzzle is made up of different factors, influences, and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

The heartland of the old ranching frontier was the foothills of southwestern Alberta, where the sheltered, well-watered valleys and warm Chinook winds still make it the centre of Canada's beef cattle industry.

Cattle (and sheep) ranching developed in the natural grassland areas, with semi-arid climates that allowed beef cattle to graze independently year-round.

About 40% of all Canadian beef cattle are born and "grazed" in Alberta.

The average area of Alberta farms is over 1,000 acres.

Drought conditions, particularly in Southern Alberta, hugely affect grazing options for livestock producers.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

Cattle ranching is an industry that is grounded in tradition, but it is also highly technical and progressive.

In addition to computers and mobile devices, cattle farmers can utilize technologies that can keep an accurate record of each animal and collect details such as diet, location tracking, and breeding history to help with disease control and traceability.

Disease can be costly and devastating to a cattle farmer; new technologies and research help prevent, diagnose, and treat livestock illnesses.

Factor 3 - MARKETS

(Where the products are sold and how, and their prices.)

Alberta is the third largest exporter of agri-food products in Canada, after Saskatchewan and Ontario. Its top exports are wheat, canola seed, beef, live cattle, and pork.

Market prices for beef fluctuate and demands change, locally and around the world.

Alberta exports to the United States, Japan, China, and Mexico.

Beef cattle are typically sold at auction markets. The meat-packing industry handles the processing of cattle and the harvesting of beef, as well as the packaging and distribution of beef products, which they sell to grocery stores and other retail outlets.

There is a small but growing market niche for small-scale, locally oriented beef producers to supply food animals that meet the standards required to be sold as natural or "certified organic" meat.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

The average beef cow herd size in Canada is 63. The average herd size in Alberta is over 230 head.

Cattle producers are long-term partners with the environment, and their business relies on ongoing sustainable access to the land and water resources.

Responsible ranch practices maintain and improve environmental integrity of grassland ecosystems to sustain viable grazing land while conserving biodiversity.

Cattle grazing can have both positive and negative effects on grassland wildlife. While overgrazing can degrade sensitive vegetation and aquatic life, managing pasturelands sustainably protects the habitat of native wildlife species.

Beef cattle are often raised on land that is unsuitable for producing grain or vegetable crops.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers and ranchers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy.

Family farming or ranching is the main form of farming and food production around the world. In Canada, approximately 97% of farms or ranches are family owned and operated, and they are often handed down from generation to generation. From the very young to grandparents, sometimes four generations work together on one ranch.

A ranch is a business, and the skills a rancher needs include being able to effectively communicate with workers, train staff, learn and utilize new technologies, analyze livestock and land quality, and make difficult and often costly decisions.

Primarily, farmers and ranchers are trained through college certification programs, mentorship on the ranch and through hands-on experience. However, many ranchers study business and science in post-secondary school. New ranchers can learn through apprenticeships on multiple ranches or by being trained and mentored on a family ranch.

Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new ranchers to acquire land and for existing ones to keep land in production.

The more than 18,000 beef cattle producers who are stewards of the industry in Alberta have one organization that represents their collective interests: the Alberta Beef Producers (ABP). Run by producers for producers, its goal is to maintain a sustainable, competitive industry for the benefit of all members.

"We strongly believe in sustainability and care about our animals and the soil, and we know that if we didn't have respect for our land, we wouldn't have a future."

Saskatchewan Grain Farming

A farm is a puzzle made up of many different pieces. Like a puzzle with pieces you can organize by size, shape, or colour, the agriculture puzzle is made up of different factors, influences, and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

With a harsh climate and thin soil, the northern part of Saskatchewan is characterized by swamp and muskeg, and is not suitable for agriculture. Farming is primarily limited to the short-grass prairie region of the southern half of the province.

The climate of Saskatchewan includes many extremes. Blizzards in winter and thunderstorms in summer are common, with even the occasional tornado in the south.

Saskatchewan's relatively short growing season profoundly affects what farmers can grow.

Water is a fundamental resource for agriculture, with Saskatchewan farmers dependent upon rivers and precipitation, and the need for conserving water is paramount.

Saskatchewan has some of the largest farms in Canada, with most averaging 1,668 acres in size.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

Farmers have access to technology and practices to help them produce more food and be more economically sustainable. Satellite technology gives grain farmers with large acreages a bird's-eye view of their entire farm, allowing for better tracking and planning.

GPS guidance technology is available to electronically steer large equipment like tractors and combines, allowing for more accurate and fewer passes at a field. Farmers now have access to digital platforms and tools that provide data about their fields and local weather monitoring to help them to better plan their harvests.

Factor 3 - MARKETS

(Where the products are sold and how, and their prices.)

Since wheat has many uses and by-products, including flour for baked goods and pasta and feed for livestock, and it's used to make beer, vodka, and biofuel, there's always been a strong market for it both in Canada and as an export product.

Canada is the second largest exporter of wheat, and its high quality is recognized around the world. Half of all of Canada's wheat is grown in Saskatchewan, making it the country's largest agri-food exporter.

Up until a few years ago, grain farmers had to sell their wheat to the Canadian Wheat Board at a fixed price and set time. Now, farmers sell directly to the grain companies, deciding for themselves who to sell to, when, and at what price. Farmers need to find the markets for their wheat and keep track of the current rates that grain companies are offering.

Market prices for grain fluctuate and demands change, locally and around the world.

Saskatchewan's agriculture industry can greatly influence the ability to meet the growing demand for food around the world. A farmer in 1900 produced enough food to feed 10 people, but today's average farmer feeds more than 120.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

Soil erosion, through spring floods, and strong winds, particularly in the dry, hot summers, are constant challenges for prairie farmers. Farming has evolved to ensure that the crop-nourishing soil – a farmer's greatest resource – doesn't blow away in clouds of dust.

Today, large-scale farming is more efficient and cost effective than farming on a small scale, producing a lower cost per unit. With larger acreage, a grain farmer is able to produce more crops and average down their unit cost.

The more land a grain farmer has, the more crops he or she can plant. That also requires more and larger machinery, and while large agricultural machines are generally more productive per unit of cost, they are expensive to buy and run.

Good farmland in Saskatchewan is limited to the southern region, where it's in demand, expensive, and not always readily available.

Protecting crops from disease and damaging pests is a constant concern for grain farmers, and each growing season presents new conditions and subsequent challenges. For example, strong rainfall followed by warm weather could generate weeds, which – if left uncontrolled – create a bridge to crops harbouring pests and disease.

Grain farmers practise crop rotation to control weeds, disease, and pests by breaking their life cycles. It also makes the soil more fertile, as legumes, such as beans and groundnuts, fix beneficial nitrogen in the soil.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy.

Family farming is the main form of farming and food production around the world. In Canada, approximately 97% of farms are family owned and operated, and they are often handed down from generation to generation. From the very young to grandparents, sometimes four generations work together on one farm.

The skills a grain farmer needs include being able to effectively communicate with workers, analyze land quality, and make difficult and often costly decisions. A farmer also needs experience operating and maintaining complex agricultural machines.

Primarily, farmers are trained through college certification programs, mentorship on the farm and through hands-on experience. However, many farmers study business and science in post-secondary school. New farmers can learn through apprenticeships on multiple ranches or by being trained and mentored on a family farm.

Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in agricultural production.

Saskatchewan grain farmers share many of the same challenges, concerns, and goals. Through joining industry associations and groups such as the Grain Growers of Canada, the Western Canadian Wheat Growers Association, and the Saskatchewan Grain Growers Association, they can access information, have a collective voice within their industry to influence change and support in government, and connect with other farmers.

"Good farmland is expensive, so we've had to build our acreage up gradually. It also takes a lot of equipment to farm this much acreage."

Manitoba Mixed Farming

A farm is a puzzle made up of many different pieces. Like a puzzle with pieces you can organize by size, shape, or colour, the agriculture puzzle is made up of different factors, influences, and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

Southern Manitoba is part of the Interior Plain, a land of rich, level prairies and rolling pastures, ideal for agriculture.

Manitoba has just over 10% of the farmland in Canada.

The climate of Manitoba includes many extremes, with very cold winters and moderately warm summers. Nearly two-thirds of the precipitation occurs during the six months of spring and summer, and the remainder comes from snow in the winter. A relatively short growing season profoundly affects what farmers can grow.

Manitoba is also one of Canada's largest cattle producers, and canola, wheat, soybeans, and potatoes are some of the province's most valuable crops.

Soil erosion, through spring floods, and strong winds, particularly in the dry, hot summers, are constant challenges for prairie farmers. Farming has evolved to ensure that the crop-nourishing soil – a farmer's greatest resource – doesn't blow away in clouds of dust.

Water is a fundamental resource for agriculture, with Manitoba farmers dependent upon rivers and precipitation, and the need for conserving water is paramount. Droughts can occur over large areas and can last for months, even years. The economic losses caused by severe drought make it one of Canada's most costly agricultural hazards.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

Farmers have access to technology and practices to help them produce more food and be more economically sustainable. Satellite technology gives farmers a bird's-eye view of their entire farm, allowing for better tracking and planning.

Technology is available to electronically steer large equipment like tractors and combines, allowing for more accurate and fewer passes at a field.

Farmers now have access to digital platforms and tools that provide data about their fields and local weather monitoring to help them to better plan their harvests.

Factor 3 - MARKETS

Agriculture plays a prominent role Manitoba's economy.

Pigs are Manitoba's most important livestock, and it is one of the largest pig-producing and exporting regions in Canada. Manitoba ships about 25% of their pork to other provinces.

The United States is Manitoba's largest export market for pork, followed by Japan, Korea, and Hong Kong.

For safety and quality assurance reasons, and the long-term sustainability of the industry, only pigs or pork products originating from federally registered and inspected plants can be exported outside of Canada.

Pig producers in Manitoba have the option to enter into direct agreements and contracts with processing plants, or they can buy and sell through brokers, such as the Manitoba Pork Marketing Co-op.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

Mixed farming operations are those that combine two or more enterprises in a single system, such as raising both crops and livestock. Since a mixed farmer has more than one source of agricultural income, the risk is spread out. If one enterprise experiences low profitability, there is a chance the other could do well. In this way, the overall income of the farm is more stable.

Although the initial costs for supplies and equipment to a mixed famer are high, there is also the possibility that the resources can be re-utilized between each enterprise. For example, the manure produced by pigs can be spread on crop fields, reducing the amount of fertilizer required. If the same farmer also plants feed corn, he can use it for his own animals and sell any extra. Mixed farmers can rotate their fields, letting cropland rest for several years, which contributes to a farm's sustainability.

Manitoba pigs are usually fed barley-based rations. Other major feed ingredients include canola meal, soybean meal, field peas, corn, and wheat. Feed is the greatest cost in pork production.

Most commercial pig production in Manitoba takes place within year-round, controlled-environment buildings, which are designed and equipped for all stages of the animal's life.

A pig farmer's practices need to address concerns from the public about odour, food safety, animal welfare, and environmental impact. Government and industry have developed guidelines and regulations that pig farmers must follow.

Managing a pig farm has a unique challenge: manure. While pig manure is spread onto fields to enrich the soil, winter spreading is prohibited, so farmers are legally required to have the capacity to store at least 200 days of manure over the winter months.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy.

Family farming is the main form of farming and food production around the world. In Canada, approximately 97% of farms are family owned and operated, and they are often handed down from generation to generation. From the very young to grandparents, sometimes four generations work together on one farm.

The skills a farmer needs include being able to effectively communicate with workers, analyze livestock and land quality, and make difficult and often costly decisions. A mixed farmer also needs experience operating and maintaining complex agricultural machinery. Primarily, farmers are trained through college certification programs, mentorship on the farm and through hands-on experience. However, many farmers study business and science in post-secondary school. New farmers can learn through apprenticeships on multiple farms or by being trained and mentored on a family farm.

Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in agricultural production.

> *"As mixed farmers, we grow things based on business decisions: what's selling in the market, and crop rotation. It's important to switch up what you grow in your fields to maintain healthy nutrients in your soil. A farm is only as good as its soil."*

Ontario Dairy Farming

A farm is a puzzle made up of many different pieces.
Like a puzzle with pieces you can organize by size, shape, or colour,
the agriculture puzzle is made up of different factors, influences,
and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

Ontario has a wide range of climates, with severe and stormy winters throughout much of the province.

Ontario has over 250,000 lakes, which contain approximately one-fifth of the world's fresh water supply. And, since much of the province is also part of the rocky Canadian Shield and forested, only small regions can support agriculture.

Historically, Ontario's economy was primarily agricultural, with an emphasis on wheat growing. Over time, the balance shifted to dairy, fruit, and vegetable farming. Gradually, farmers began to specialize.

Ontario has just over 50% of Canada's best agriculture land. The average farm size is around 250 acres.

Dairy is the second largest agriculture sector in Canada, following beef. There are nearly 11,000 dairy farms in Canada, with about 4,000 of them in Ontario.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and protecting their land.

Dairy farming is an industry grounded in tradition, with much of the work being done manually, but it is also highly technical and progressive.

In addition to computers and mobile devices, dairy farmers can utilize technology that keeps data on each cow, collecting information to support their decision-making. The ability to identify a sick cow sooner rather than later improves treatments, resulting in reduced disease in the herd, increased lifespan, and improved well-being for the cow.

Automation technology in the dairy industry is changing the way dairy farmers produce milk. New technology in the dairy industry focuses on improving profitability, milk quality, lifestyle, and animal welfare.

Factor 3 - MARKETS

(Where products are sold and how, and their prices.)

Dairy is the largest sector of Ontario agriculture, and agriculture is the second largest industry in the province (only the automotive industry is bigger).

A dairy farmer's income is earned solely from selling their milk in the marketplace.

Canadian farmers produce milk for Canadians. Nearly all of the milk produced around the world is consumed in the country of origin. Ontario dairy farmers do not export their milk.

Ontario farmers typically sell their products through marketing boards that were established as far back as the 1930's. These boards work towards maintaining regularity and predictability in the marketing of agricultural products such as milk, supporting the farmers' collective interests. The marketing board in Ontario is the Dairy Farmers of Ontario (DFO). To manage production and produce the exact amount of milk to meet consumer demand, the DFO administers a licensing and quota system, which gives dairy farmers the right to produce a set amount of milk and sell it at fixed prices.

Factor 3 - MARKETS cont'd

The DFO operates a sophisticated transportation network that moves milk from the dairy farms to local processing plants. Refrigerated milk trucks pick up the milk from the dairy farms every other day to transport it to a dairy processing plant to be pasteurized (heat treated) and sold fresh or further processed into products such as cheese, ice cream, or yogurt. It takes two to three days for fresh milk to get from the farm to the store.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

The amount of milk a cow can produce is one of the most important considerations in building a dairy herd. Holstein cattle, which were brought to Canada from Holland in 1881, comprise over 85% of Canadian dairy cattle. The breed is characterized by their black-and-white coat, large size, and outstanding milk production.

In Canada, dairy farms are family owned and operated. These farms are not factories, and ensuring the welfare and well-being of their animals is farmers' number one priority – their herd is their livelihood. Everything a dairy farmer does is based on providing the cow with a comfortable, minimal stress environment.

In 2009, dairy farmers across Canada adopted a policy aiming to reduce their environmental footprint through adopting practices that limit the use of energy and water in dairy production, conserve soil, encourage the use and production of renewable energy on farms, reduce greenhouse gas emissions, and meet stringent cleanliness, animal health, and milk quality standards.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy. Dairy farms are great places for young people to help out and learn about farming – feeding and taking care of calves is a favourite job.

Family farming is the main form of farming and food production around the world. In Canada, approximately 97% of farms are family owned and operated, and they are often handed down from generation to generation. From the very young to grandparents, sometimes four generations work together on one farm.

A farm is a business, and the skills a dairy farmer needs include being able to effectively communicate with workers, analyze livestock and land quality, and make difficult and often costly decisions. A farmer today also needs to understand and implement new technologies for their business and train their employees. Because of the large capital investment required to run a dairy farm, it's also important to be a good money manager.

Technology is meant to assist farmers, not replace them. While technology can tell a farmer what's wrong with a cow, it takes experience and knowledge to make decisions on how to react to the information.

Primarily, farmers are trained through college certification programs, mentorship on the farm and through hands-on experience. However, many farmers study business and science in post-secondary school. New farmers can learn through apprenticeships on multiple farms or by being trained and mentored on a family farm.

There are high costs associated with entering the farming industry. Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in agricultural production.

"Look after the cows, and they will look after you."

Nova Scotia Wild Blueberry Farming

A farm is a puzzle made up of many different pieces.
Like a puzzle with pieces you can organize by size, shape, or colour,
the agriculture puzzle is made up of different factors, influences,
and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

Nova Scotia, Canada's second-smallest province, includes over 3,000 lakes as well as hundreds of streams and small rivers. It has a mountainous interior, with a rugged coastline marked by many inlets, island coves, and bays.

There are about 3,700 farms in Nova Scotia, and the average size of each one is around 300 acres.

The Annapolis Valley, on the western part of the peninsula, is home to most of the province's farms, including dairy, poultry, beef, and horticultural farms, as well as the apple orchards it is famous for.

There are approximately 1,000 wild blueberry growers in Nova Scotia, with more than 33,000 acres in production. Some growers have only a few acres, while others have more than 1,000.

The surrounding ocean moderates the climate, and cool temperatures at night, along with long, sunny days, help wild blueberry growers to produce flavourful berries.

Wild lowbush blueberries grow naturally in Nova Scotia, and for centuries, they were a prized food among its First Nations people.

There are only six areas in the world where wild lowbush blueberries grow commercially: Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland, Quebec, and Maine. They grow wild in the acidic soils of these areas and spread through underground stems called rhizomes. As rhizomes spread, new shoots develop and form stems that bear the wild berries.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

In 1883, the wild blueberry hand rake was developed in Maine. The rake is positioned with its tines parallel to the ground. As the rake is combed through the plant's stems, it is tipped back and the berries fall into the back of the rake to be emptied into buckets. All wild berries were harvested by hand raking until 1984, when the first mechanical harvesters were invented. The harvesters have large rakes on rotating drums that are attached to tractors. The berries move up a conveyor belt from the rake onto a platform behind the tractor, where workers empty them into crates. Workers still hand-pick the smallest berries for the table market, while mechanical pickers are used for the berries destined for freezing and processing. Farmers also use mechanical harvesters where the land is reasonably level and free of rocks, but on the rougher terrain, they harvest by hand.

Although farmers don't plant wild blueberries, they encourage growth through pruning, and over the seasons, guide the bushes to fill in bare spots. With large fields that are often on hilly and difficult terrain, farmers spend a lot of time on foot scouting their plants. Now, many farmers use flying drones to scout their plants. The single-propeller drones resemble small airplanes and are used to map wild blueberry fields. Farmers use them to spot troubled areas in a massive blueberry patch.

Factor 3 - MARKETS

(Where the products are sold and how, and their prices.)

Canada's blueberries are commercially grown in both wild and cultivated varieties, making them unique – no other Canadian fruit shares this distinction.

Canada is the world's largest producer of "lowbush blueberries," which is another name for wild blueberries. Most are grown commercially in Quebec and the Atlantic provinces.

"Highbush" refers to cultivated blueberry plants, which were developed from the wild variety in the first half of the 20th century. British Columbia grows the majority of highbush blueberries, but they are also grown in Ontario, Quebec, and Nova Scotia. They are larger and less perishable than lowbush berries, which makes them suitable for shipping. As a result, much of the highbush crop is sold fresh, while the lowbush crop is sold for processing and freezing. There are only a few major processors in Nova Scotia for farmers to sell their crops to.

Blueberries are rich in antioxidants, low in calories, and high in fibre and nutrients. Awareness of these health benefits has translated into increased market demand, which has meant an increase in blueberry growing areas and production for both wild and cultivated varieties.

The wild lowbush blueberry crop is worth more to Nova Scotia's economy than any other fruit crop, and it is the number one fruit crop in export sales. Nova Scotia wild blueberries are exported to the United States, Japan, Germany, the United Kingdom, and other countries.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

Wild lowbush blueberry plants are perennial, which means they return year after year, so there is no need for producers to till the soil or seed the ground. In fact, wild blueberries grow better in undisturbed soil. A wild blueberry farmer's job is to manage their plants through pruning, fertilizing, reducing competing vegetation, and controlling pests and disease.

Since they are not planted (only managed and encouraged to grow), it's crucial to start with a good natural base of plants. Land that is reasonably flat and not rocky (such as formerly farmed land or forest and brush land), which machines can operate on, is best suited to wild blueberry production. It can take many years to clear and prepare the land before a farmer benefits from a harvest.

Since wild blueberries are harvested every other year, pests, disease, drought, frost, and hard winters can have longer and more lasting effects than they do on other crops, and a poor crop can have a long-term impact on a wild blueberry grower's income.

"Nova Scotia's provincial berry, the wild blueberry, is a unique food crop. Because they're wild, they can't be planted or farmed like other crops."

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

The pride that growers take in producing high-quality wild blueberries stems from hard work and knowledge gained from generations of farming.

The skills a farmer needs include being able to effectively communicate with workers, analyze land quality, and be able to operate and maintain complex agricultural machines. Primarily, farmers are trained through college certification programs, mentorship on the farm and through hands-on experience. However, many farmers study business and science in post-secondary school. New farmers can learn through apprenticeships on multiple ranches or by being trained and mentored on a family farm.

Growers work together and share resources. Nova Scotia farmers join the Wild Blueberry Producers Association of Nova Scotia (WBPANS), so that collectively, they can have a voice in government (to affect policy decisions), industry, and the public. THE WBPANS also conducts and shares results of research projects that aim to improve the wild blueberry industry.

"Seven years ago, with zero board experience, I [wild blueberry farmer, David Atkinson] became a board member of the Wild Blueberry Producers Association of Nova Scotia. I was active as a director and vice chair and then joined their research and sustainability committees. I have learned and gained opportunities that I did not even imagine I would. I helped build and instruct a Wild Blueberry Harvester Safety course offered to other farmers in the industry that involves providing coaching skills to help other farmers in the industry run mechanical harvesters."

"I also joined the NS Young Farmers group, and the past two years have attended the national Canadian Young Farmers Forum (CYFF) to connect with other Canadian farmers and share our enthusiasm and knowledge. CYFF is a national organization that connects leading young agriculture producers of all the commodities across Canada to provide support, encouragement, and resources to promote agriculture. Through attending their annual meetings I've learned business planning and so much valuable information on how young farmers are extremely hard workers and share great pride in helping deliver healthy food to Canadians and others around the whole world."

"I'm very passionate about wild blueberry farming, and it's a great opportunity to share stories with other enthusiastic young farmers. It's inspiring to see what others are doing and to have a voice in the industry!"

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers.

There are high costs associated with entering the farming industry. Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in agricultural production.

"I love being in agriculture because I get to be my own boss and have my family involved in the business."

Prince Edward Island Potato Farming

A farm is a puzzle made up of many different pieces.
Like a puzzle with pieces you can organize by size, shape, or colour,
the agriculture puzzle is made up of different factors, influences,
and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

PEI has a total land area of 1.4 million acres, with approximately 594,000 acres cleared for agricultural use. It has the highest percentage of arable land of any Canadian province. The average farm size is about 400 acres.

The climate on the island is temperate and moderated by the surrounding ocean.

Potatoes are PEI's single largest agricultural commodity. Grains and oilseeds are grown in rotation with potato crops.

PEI has near ideal soil and climate for growing potatoes, and they've been grown as a crop on the island since the late 1700's.

The red, sandy soil, unique to this tiny province, retains the right amount of moisture during the growing season. It's also rich in iron, giving PEI potatoes their great taste.

Being a small island offers an advantage to PEI potato growers; the ocean acts as a natural barrier, protecting crops from some airborne or insect-borne diseases.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

Most potato growers now use GPS guidance technology to plant, spray, fertilizer, or harvest their crops. The most common technology is autosteer, which allows the farmer to steer their tractor and planter with one-inch repeatability in any field type to maintain perfect spacing between rows – this increases their productivity and profitability. You can tell when a row of potato plants has been planted using autosteer – it's perfectly straight.

Farmers have access to technology and practices to help them produce more food and be more economically sustainable. Satellite technology gives farmers a bird's-eye view of their entire farm, allowing for better tracking and planning.

Farmers now have access to digital platforms and tools that provide data about their fields and local weather monitoring to help them to better plan their harvests.

Factor 3 - MARKETS

Over 88,000 acres of potatoes are grown on PEI each year, making it Canada's largest potato-producing province. PEI farmers grow one-third of Canada's potatoes, and their table and seed potatoes are exported to more than 20 countries.

Potato production is a major contributor to the island economy.

PEI potatoes are grown for three specific markets:

1. Table potatoes (fresh, whole product sold to retail)
2. Processing potatoes (manufactured into French fries, potato chips, and other products)
3. Seed potatoes (for future commercial potato crops)

The majority of Prince Edward Island potatoes are sold for processing, 30% as table potatoes, and 10% for seed purposes.

PEI's easy access to the ocean facilitates transporting their product to other markets.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

Potato farms are scattered throughout this small but densely populated island – on PEI, if you're not a farmer, you're a farmer's neighbour. Farming is a tradition and way of life on the island, and PEI farmers today are especially committed to ensuring their farming practices are environmentally sustainable, socially acceptable, and economically viable. They follow strategic plans called "Enhanced Environmental Farm Plans," which involve identifying, evaluating, and addressing all environmental risks and opportunities on their farm, including such things as the proper storage of pesticides and fuel, water and nutrient management, and erosion control.

PEI potato farmers have a responsibility to maintain healthy, pollutant-free waterways, which provide drinking water to many islanders as well as serve as habitat for a diverse number of aquatic species.

Prince Edward Island potato growers have a strong commitment to producing a high-quality product. The industry inspects all shipments before they leave the province to make sure only the highest quality potatoes go to outside markets. Potato farmers collectively own and operate an Elite Seed Farm, established in 1962, which is dedicated to producing high-quality seed, monitoring plant health, and eradicating disease in seed stock.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

The pride that PEI growers take in producing high-quality potatoes stems from hard work and knowledge gained from generations of farming. With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by longtime farmers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy.

There are approximately 200 potato growers on PEI, and the majority of them operate on family farms, often with multiple generations working together. Most people in the province are connected in some way to the island farms, either through direct employment or through their family and friends.

PEI potato growers work together and share resources. The PEI Department of Agriculture and Fisheries works with the industry to educate growers on best management practices, including integrated pest management, improving soil fertility, eliminating soil erosion, and improving plant health.

PEI has developed a one-of-a-kind two-year apprenticeship program that addresses the demand for a skilled, sustainable, agricultural workforce in the province. The PEI Farm Technician Apprenticeship Program combines year-round on-farm experience with a farm mentor with five weeks of classroom learning through Dalhousie University Faculty of Agriculture.

There are high costs associated with entering the farming industry. Rising land prices and developmental pressures, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in agricultural production.

PEI is a small province with limited space. It's also a popular tourist destination. A major concern to the agriculture industry is the loss of large tracts of land to recreation or development.

"This province has a rich farming heritage, and we're proud to be a part of it, and we're especially proud of the product that we grow. Meeting our customers gives us the opportunity to talk to them about what we do, as well as further the farm food connection."

Newfoundland and Labrador Chicken Farming

A farm is a puzzle made up of many different pieces.
Like a puzzle with pieces you can organize by size, shape, or colour,
the agriculture puzzle is made up of different factors, influences,
and challenges to be solved, or turned into opportunities.

Factor 1 - LAND & ENVIRONMENT

The island of Newfoundland is the easternmost region of Canada, while Labrador is located on the mainland to the northwest.

The "Rock" is characterized by dramatic coastlines, sweeping barrens, thick boreal forests, and ancient rock formations.

With over 29,000 km of coastline, early settlers, who were drawn by the fisheries, clustered on the shoreline in bays and coves close to the inshore and offshore fishing grounds, primarily on the east coast.

With its rocky, rugged terrain and poor soil, along with a tough climate that varies considerably, farming here has never been easy, and Newfoundland and Labrador have the fewest number of farms among the provinces – less than 1% of all farms in Canada.

The average farm size is around 175 acres; smaller than the Canadian average.

Factor 2 - TECHNOLOGY

Technology and science play a crucial role in all aspects of modern agriculture. In addition to helping farmers manage their day-to-day lives, connecting them with other people and information like never before, there are applications specific to their industry that help with everything from managing their business, increasing their farm efficiencies and profitability, and maximizing yields of crops to minimizing costs and protecting their land.

Automation technology in the poultry industry is changing the way farmers raise chickens. New technology focuses on improving profitability, quality, food safety, and animal welfare.

Climate-controlled barns to house chickens is one way that technology is impacting poultry farm practices. A good indoor climate is crucial to the animal's welfare and, therefore, the poultry producer's profitability. The temperature inside the barns is adjusted as the chickens grow. While chickens are brooding, the temperature is kept high using heat lamps. Several large fans on one end or side of the building help circulate the air in climate-controlled barns.

Climate-control systems help reduce respiratory, digestive, and behavioural disorders that result from poor climate conditions.

A major problem in chicken barns is ammonia, a gas that results from the chemical decomposition of uric acid in droppings by certain bacteria in the poultry litter (especially when littler is wet or the same litter is used for successive flocks). Air circulation from climate-control systems helps with ventilation and keeping the litter dry. A specialized sensor constantly measures and monitors the ammonia concentration in poultry houses, providing data to help with climate regulation, manure removal, and feed management in the poultry barn.

Adoption of new technology can bring new challenges for farmers: training staff, poor internet speeds on some farms, and costs associated with continual updates.

Factor 3 - MARKETS

While the agriculture industry in the province is small, there's still a need to produce food. More than 75% of agricultural income for the province comes from sales of poultry, dairy products, and eggs.

The Canadian chicken industry helps generate a variety jobs not only in farming and processing but in transportation and retail. Chicken farmers purchase large amounts of feed, which, in turn, supports other farmers.

Newfoundland chicken farmers sell their poultry to specialized and highly regulated processors. Being in close proximity to the producers and processors is important.

Factor 3 - MARKETS cont'd

Newfoundland has the highest proportion of operations selling agricultural products, such as fruits, vegetables, meat, poultry, and eggs, directly to consumers, with approximately 35% of farms selling products through farm-gate sales, stands, or u-pick – over double the national average.

Factor 4 - ECONOMIC SUSTAINABILITY & SUSTAINABLE AGRICULTURE

(Costs of farming, and balancing making a living with protecting land for current and future generations. Sustainability in agriculture means good stewardship of the natural systems and resources that farms rely on. A key theme connecting practices towards agricultural sustainability is diversity.)

Newfoundland and Labrador are isolated from the mainland. Since much of the province is generally not suitable for agriculture, and they can't produce enough of their own food for both human consumption and livestock, they need to bring it in. Importing and storing feed for livestock is a Newfoundland poultry farmer's biggest expense. Farmers would benefit from access to more land to grow hay, winter wheat, and other forages. They could also sell the crops to local dairy producers and use the leftover straw as bedding for their chickens, lowering costs and improving efficiency.

Chicken Farmers of Newfoundland Labrador (CFNL) and Chicken Farmers of Canada are not-for-profit organizations comprised of farmers and industry representatives, and they were established to regulate the poultry industry. To support a healthy and sustainable industry, they use a risk-management system known as "supply management." They carefully figure out how much chicken Canada needs, and farmers make sure to produce that amount. This way, consumers are assured a reliable supply of fresh, high-quality food at a reasonable price, and in return, farmers receive fair and stable returns for their work.

The CFNL also implements rules to protect animal health and ensure cleanliness and safety throughout each step of the production cycle. For instance, after chickens have been shipped to the processing plant, farmers follow strict barn cleaning procedures. Before the next flock is delivered, waterlines are cleaned and/or disinfected, and barns are extremely well cleaned, including litter removal. These farm practices are strictly regulated and monitored.

Factor 5 - HUMAN: FAMILY, COMMUNITY, & LEGACY

Newfoundland chicken farmers work together and share resources. The CFNL is made up of poultry farmers and industry representatives, and its goal it to share knowledge on best business practices, implement regulations, and market poultry to consumers.

Newfoundland farmers still face the same challenges their ancestors faced: limited arable land, a short growing season, a small population base, and isolation from the mainland.

With an ageing population and fewer young people entering agriculture, we lose the wealth of knowledge and experience held by long-time farmers. Since today's youth are more computer and cell phone savvy than the older generations, new technology just might be one thing that compels them to continue their families' farming legacy.

The skills a farmer needs include being able to effectively communicate with workers, and analyze livestock and land quality. A farmer today also needs to understand and implement new technologies for their business. Primarily, farmers are trained through college certification programs, mentorship on the farm and through hands-on experience. However, many farmers study business and science in post-secondary school. New farmers can learn through apprenticeships on multiple farms or by being trained and mentored on a family farm.

There are high costs associated with entering the farming industry. Equipment, buildings, rising land prices, as well as zoning and other regulations affecting agricultural land use, make it difficult for new farmers to acquire land and for existing farmers to keep land in agricultural production.

"This is the frontier of agriculture in Canada. We are untouched, really, when you compare us to the rest of the country. So, we have the potential for this industry to grow in leaps and bounds."

Student Worksheet

Student Name: .....

Date: .....

Five Factors (Land & Environment; Technology; Markets; Economic Sustainability & Sustainable Agriculture; Human: Family, Community, & Legacy)

Of the five factors, which was the most interesting to you? Why?

Which factor do you think most impacts your farmer?

Which factor do you think has the least impact on your farmer?

How has your farmer's operation today changed from its roots?

Which factor do you think has the greatest impact on Canadian farmers? Why?

What are some of the factors and challenges that Canadian farmers share?

In what ways do farming practices impact all Canadians?

A farm is a puzzle made up of many different pieces. Like a puzzle with pieces you can organize by size, shape, or colour, the agriculture puzzle is made up of different factors, influences, and challenges to be solved, or turned into opportunities.

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Acre is a unit of area commonly used for measuring tracts of land and can be measured in any shape, from rectangles to circles or even hexagons, as long as the total area of land is 4,046.86 square metres. How big is that? Visualize 75% of a football field, or 16 tennis courts in a 4x4 formation, or a parking lot with 150 cars.

Agribusiness refers to the business of farming and agriculturally-related businesses that supply farm inputs, such as farm machinery and seed supply, and businesses involved in the marketing of farm products, such as warehouses, wholesalers, processors, and retailers.

Agri-food relates to the commercial production of food by farming.

An **Agvocate** is an individual or group that actively promotes agriculture by adding their voice to the food conversation in respectful and meaningful ways.

Arable Land refers to land that is suitable for or capable of growing crops.

Brooding Chickens are hens that are ready to lay eggs.

Cash Crops are those that are produced by the famer for the purpose of selling.

Cattle are domesticated bovine farm animals that are raised for their meat, milk, or hides.

Conservation Tillage is a method of soil cultivation that leaves the previous year's crop residue (such wheat stubble) on fields before and after planting the next crop to reduce soil erosion and runoff.

Crop Rotation is the systematic planting of different crops, in a particular order and over several years, in the same growing space. This process helps to maintain nutrients in the soil, reduce soil erosion, and prevent plant diseases and pests.

Crops are plant or animal products that can be grown and harvested extensively for profit or subsistence. It also represents the total production from a specified area.

A **Dugout** is a large excavation designed to catch spring runoff from fields, which is then used to water and irrigate them during the dry summer months.

An **Ecosystem** includes all of the living things (plants, animals, and organisms) in a given area that interact with each other and also with their non-living environments (weather, Earth, sun, soil, climate, and atmosphere).

Farm Income refers to profits and losses incurred through the operation of a farm.

Fertilizer is organic or non-organic nutrients that are added to soil to help crop growth.

Food Insecurity exists when people do not have adequate physical, social, or economic access to food.

connectAG Farm Glossary

Food Security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Global Positioning System (GPS) is a satellite-based navigation system made up of at least 24 satellites. GPS equipment manufacturers have developed several tools to help farmers and agribusinesses become more productive and efficient in their precision farming activities. Many farmers use GPS-derived products to enhance operations in their farming businesses. Location information is collected by GPS receivers for mapping field boundaries, roads, irrigation systems, and problem areas in crops, such as weeds or disease. The accuracy of GPS allows farmers to create farm maps with precise acreage for field areas, road locations, and distances between points of interest. GPS technology allows farmers to accurately navigate to specific locations in the field, year after year, to collect soil samples or monitor crop conditions.

Harvest is the process of gathering a crop when it is finished growing, typically at the end of a season.

Hectares are a commonly used unit for descriptions of land and agriculture. A hectare is a unit of measurement for an area that measures 100 metres one each side, specifically representing 10,000 square metres, and is the equivalent of 2.47 acres.

Heifers are young female cows that have not had calves so do not yet produce milk.

Herbicide is a chemical substance used to control or manipulate undesirable vegetation, especially weeds. Herbicides are classified into two categories: selective and non-selective. Selective herbicides kill specific unwanted plants, while leaving desirable vegetation relatively unharmed. Non-selective herbicides kill all or most plant species.

A **Hybrid Plant** is created when plant breeders intentionally cross-pollinate two different varieties of a plant, aiming to produce an offspring, or hybrid, that contains the best traits of each of the parents. Cross-pollination is a natural process that occurs within members of the same plant species. In hybridization, pollination is carefully controlled to ensure that selected plants are crossed to achieve a chosen combination of characteristics, such as bigger size or better disease resistance.

Hydroponic Plants are grown in nutrient solutions with or without an inert medium (such as soil) to provide mechanical support.

Input refers to the amount of energy and money put into a farm in order to make a product.

Insecticides are agents of chemical or biological origin that control insects and may be natural or man-made.

Legumes are plants that grow seeds in a pod, such as peas and beans. The legume family includes dried beans, peas, and lentils.

Livestock refers to horses, cattle, sheep, and other useful animals kept or raised on a farm or ranch. The animals you find on a farm are collectively called livestock. A herd of dairy cows are livestock, but your hamster is a pet.

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Manure is solid waste from livestock used to spread on the ground to nourish the soil.

Market is where the products are sold and how, and their prices.

Microorganisms are organisms that can be seen only with the aid of a microscope and typically consist of only a single cell. Microorganisms include bacteria, protozoans, and certain algae and fungi.

Mixed Farming operations are those that combine two or more enterprises in a single system. For example, a popular mixed farming method is to raise both crops and livestock.

Monoculture (or Monocropping) refers to cultivating only one crop on a piece of land or agricultural property.

Nutrients refers to nitrogen, phosphorous, potassium, and minerals that plants need to grow

Organic Farming promotes the sustainable health and productivity of the ecosystem – soil, plants, animals, and people. Organic foods are farmed in an environmentally sustainable and socially responsible way, focusing on soil regeneration, water conservation, and animal welfare without the use of laboratory-made fertilizers, growth substances, or pesticides.

Organic Matter is anything that contains carbon compounds that were formed by living organisms. It covers a wide range of things, such as lawn clippings, leaves, stems, branches, moss, algae, lichens, any parts of animals, manure, droppings, sewage sludge, sawdust, insects, earthworms, and microbes.

Pasture is an area of land covered with grass or other plants used or suitable for grazing livestock.

A **Plow** is an agricultural implement used for cutting, lifting, turning over, and preparing the top layer of soil for planting.

Pollinate is the process by which plant pollen is transferred from the male reproductive organs to the female reproductive organs to form seeds.

Pollinators, such as wind or insects, are vital to production agriculture. Approximately 30% of the food and fibre crops grown throughout the world depend upon pollinators for reproduction.

Poultry are domesticated fowl collectively (especially those valued for their meat and eggs), such as chickens, turkeys, ducks, geese, and guinea fowl.

Propagation is the breeding of specimens of a plant or animal by natural processes from the parent stock.

A **Quarter Section** starts with a square plot of land that is 1 mile by 1 mile, is referred to as a "section" of land, and contains 640 acres. One section is divided into four equal parts, which are called "quarter sections," and this is the size plot that farmland is typically sold in. Each quarter section consists of 160 acres. In western Canadian farm communities, the grid roads are spaced at 1- and 2-mile intervals, thus providing some of the dividing lines between sections and access to every quarter section.

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Quota refers to the number or amount constituting a proportional share. Farm quotas are government-administered quantity allotments restricting what a farmer can produce or market. The governing body sets the quota for the total national supply of certain commodities, and based on this, they set the commodity price.

Rhizomes are horizontal underground plant stems capable of producing shoot and root systems of a new plant, allowing vegetative propagation. Rhizomes store starch and proteins and enable a plant to survive during the winter. Often, rhizomes run just under the soil, sprouting roots and shooting up new vertical stems as they go. Rhizomes of some plants, such as ginger, turmeric, and lotus, are edible.

Scouting is the process of monitoring crop development in each field to evaluate crop concerns, such as potential pests and diseases. Ideally, farmers should scout their own fields to know first-hand how their crops are performing. Field scouting also allows farmers to catch an issue at the early stages, before it becomes a big problem.

Soil Conservation is the name given to a handful of techniques aimed at preserving the nutrient level of the soil and preventing erosion.

Soil Erosion is a naturally occurring process that affects all landforms. In agriculture, soil erosion refers to the wearing away of a field's topsoil by the natural physical forces of water and wind, or through forces associated with farming activities such as tillage. Erosion removes the topsoil that is filled with organic matter, nutrients, and microorganisms that are required for plants to grow.

Stewardship is the careful and responsible management of something entrusted to one's care.

Supply Management is a term for marketing boards that control the price of milk, cheese, eggs, chicken, and turkey in Canada. There are about 17,000 Canadian farms – about 8% of all farms in Canada – that operate under supply management. The system places limits on amounts produced within Canada and places tariffs on products from other countries to limit imports.

Technology is applying the science of knowledge through research to practical purposes, such as developing instruments, tools, or inventions to increase efficiency.

Tillage is the practice of working land by plowing, sowing, and turning it. Conventional tillage incorporates or buries most of the crop residue into the soil. Since this method plows under much of the crop stubble, it leaves the surface relatively bare and without cover protection. In **Conservation Tillage**, farmers use special equipment to plant seeds, leaving most of the residues (e.g., stalks) of the previous crop intact. With No-till Seeding, there is even less disruption of soil (e.g., the planter does not go as deep into the soil to plant the seeds, and no crop residue is turned over).

Urbanization is an increase in population in cities and towns versus rural areas.

Yield is the amount of a crop produced in a given time or from a given place. Crop Yield is a measurement of the amount of agricultural production harvested per unit of land area and is most often used for cereal, grain, or legumes. To estimate crop yield, producers count the amount of a given crop harvested in a sample area. The harvested crop is then weighed, and the crop yield of the entire field is estimated from the sample.

For more information on this resource,
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