



International Journal of Multidisciplinary Research and Growth Evaluation.

Agriculture in Canada

Matthew NO Sadiku ^{1*}, Chandra MM Kotteti ², Janet O Sadiku ³

¹ Department of Electrical & Computer Engineering, Prairie View A&M University, Prairie View, TX USA

² School of Computer Science and Information Systems, Northwest Missouri State University, Maryville, MO 64468

³ Juliana King University, Houston, TX, USA

* Corresponding Author: **Matthew NO Sadiku**

Article Info

ISSN (online): 2582-7138

Volume: 05

Issue: 01

January-February 2024

Received: 20-12-2023

Accepted: 21-01-2024

Page No: 833-838

Abstract

The agriculture industry plays an important role in Canada's economy and society. It is one of the sectors with the highest economic growth potential in Canada. It contributes greatly to the livelihoods of Canadians in several direct and indirect ways. Canadian farmers produce such a diversity of crops and livestock products. Canada's top agricultural products include canola, cattle (cow), and calves, beef and veal, vegetables, and poultry. Canada is a global leader in agricultural exports. This paper explores agricultural production in Canada and helps us understand the role of agriculture in Canada's past, present, and future.

Keywords: Agriculture, farming, Canada, Canadian agriculture, traditional agriculture

Introduction

Food is essential to our survival and is also our medicine. It brings people together to celebrate, mourn, connect and communicate. It is a universal language. We learn about cultures, traditions, and history through food. Canadians constitute one of the few world nations that grow more food than it needs; that exports more food than it consumes. Canadian farmers provide sustainable, nutritious food for families across the nation and around the world. Canada's agriculture sector ensures food security and supply chain stability in Canada. Not only does the sector feed the people, but it adds massive value to the economy through sales, exports and employment each year.

The agriculture sector is a major contributor to the Canadian economy. Canada's food system is resilient and innovative; it employed 573,100 people and provided 1 in 34 jobs in Canada in 2022. Agriculture, aquaculture, fisheries, and food and beverage manufacturing are all part of the agri-food industry. The agriculture sector makes a significant indirect and direct contribution to Canadians' livelihoods. Agriculture is a major land use in Canada. Figure 1 displays the number of hectares covered by farms across Canada in 2018 ^[1].

Agriculture in Canada is the practice of growing crops and rearing animals, mainly for food. It is also among the most sophisticated and technologically advanced in the world, using scientific methods and state-of-the-art equipment. Canadian farms and ranches produce a wide variety of crops, livestock, food, feed, fibre, fuel, and other goods. Crops are not only for human consumption but also for animal consumption. Given its vast land area spanning numerous regions, it is no surprise that Canadian farmers generate such a diverse range of livestock and crop products. Canada's agriculture industry is diverse, producing grains, oil seeds, livestock, dairy, horticulture, poultry, eggs, etc. Goats are raised to produce dairy, meat, fiber, and skin products. The agricultural production depends on the geography of the province. Domestic trade encompasses providing goods within Canada provincially and inter-provincial. Most of Canada's crop farming takes place in the Prairie provinces (Alberta, Saskatchewan, and Manitoba). Saskatchewan produces the most durum wheat, canola, and lentils. Manitoba has the most pig farms and is second in potato production. In British Columbia, farmers produce large amounts of fruit, vegetables, aquaculture products, eggs, and poultry meat ^[2].

Ontario farmers produce the most corn and apples in Canada. Canada is the world's third-largest exporter of pork. Figure 2 shows major agricultural commodity by province [3]. As shown in Figure 3, Canada is a top ten global producers of some agricultural products [4]. At the federal level, overview of Canadian agriculture is the

responsibility of the Department of Agriculture and Agri-Food. The current funding framework for agriculture is called the Canadian Agricultural Partnership. Government funds support agricultural research, export, and trade. They also help farmers use new practices and technologies.



Fig 1: The number of hectares covered by farms across Canada in 2018 [1]

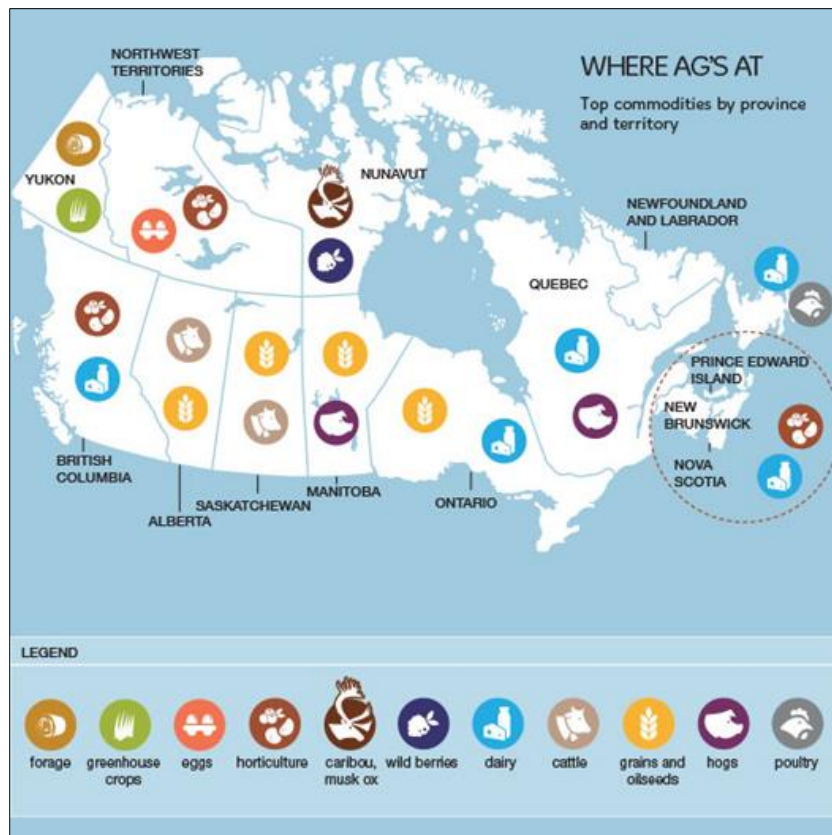


Fig 2: Major agricultural commodity by province [3]



Fig 3: Canada is a top ten global producer of some agricultural products [4]

Brief history of Canadian agriculture

The agricultural sector in Canada in the mid-19th century reflected the country's diverse regions and growing conditions. In the late 19th and early 20th centuries, farmers used horses or oxen for everything from clearing land to plowing fields to pulling rakes, reapers, and mowers. Figure 4 shows a Canadian farmer plowing with horses [5]. Mechanization changed all that. Handling a horse-drawn

plow took a lot of strength and skill. Fossil-fuel-powered tractors—which became increasingly commonplace by the 1920s—made it possible to complete the same amount of work in far less time. But that greater productivity came with a price. It took money to purchase and maintain the equipment, while fuel had to be bought rather than grown. When Russian wheat exports were cut off during the First World War, demand for North American grain surged.



Fig 4: A Canadian farmer plowing with horses [5]

Then came the drought of 1929. Strong prairie winds lifted the topsoil, while grasshoppers, rust and hailstorms devastated crops across the country. Unsustainable farming practices had created the perfect conditions for widespread erosion. Extreme weather caused by climate change made it more difficult for farmers to plan. Farmers and agricultural researchers were compelled to find ways to protect the soil. Most farmers had no access to vets since Canada's first veterinary college didn't open until 1862 in Toronto. From the late 19th century to the mid-20th century, a great percentage of the Canadian labor force was engaged in smaller farming practices. Farming activities were very labor-intensive before the industrial revolution and the advent of tractors, combines, balers, etc. After mechanization, scientific advancement, improved marketing practices farms became more efficient, larger, and less labor-intensive. From soil sensors to drone-based crop monitoring,

agriculture today is becoming increasingly high-tech. Today, we rely on the Internet for everything from marketing to data management to YouTube videos on how to make your own mulch. To Canadian farmers, practical skills were considered more essential than business management, crop science, marketing, and animal care. In 2011, over half of farm operators had a post-secondary education with the average age was 54 years old. Canadian farmers in the 55-and-older category represent the largest percentage of total operators [5]. Agriculture in the 21st century has evolved into a sophisticated, innovation-driven, technology-based industry. Today's agricultural machines are also software systems running on proprietary platforms. Agricultural innovation is the key driver of economic growth, enabling greater competitiveness as well as opportunities to meet food security and sustainability goals in Canada and around the world.

Canadian Agriculture

Agricultural science began developing new styles of farming and strains of wheat and crops so that farming could become a successful venture. Agriculture is increasingly technological and digital, driven by data, AI, and machine learning. It is not just new technology, but new ways of doing business. Figure 5 shows an example of modern farming in Canada [6].



Fig 5: Modern farming in Canada [6]

In 2018, Canada was the world's largest producer of rapeseed, the 2nd largest producer of oats in the world, the 6th largest world producer of wheat and barley, the 7th largest world producer of soy, the 10th largest world producer of maize, and the 12th largest world producer of potato [7]. Wheat is the most widely planted crop in Canada, followed by canola. Figure 6 shows a canola field [8]. Wheat and corn are commonly farmed in the nation. Wheat is a staple crop from Canada; varieties of wheat were developed at the beginning of the 20th century. Canada is the world's leading grower and exporter of flax-seed. It is also the world's top producer and supplier of maple syrup. It grows over 125 distinct vegetables and fruit crops.

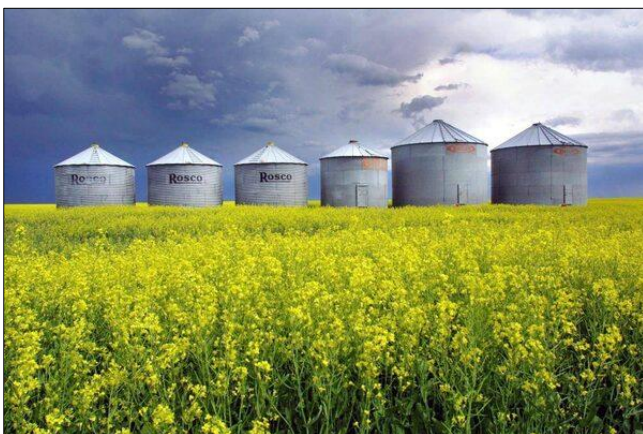


Fig 6: A canola field [6]

The type of fertilizer Canadian farm operators applied to crops, the methods they used and the timing of the application are important farm management practices to optimize yields. Aside from custom or common blends, 32% of field crop producers across Canada used urea fertilizer products. The majority of field crop producers in Manitoba (72%), Saskatchewan (71%), and Alberta (63%), who applied commercial fertilizer used the banded or injecting fertilizer

application methods [9].

Benefits

The level of production has increased dramatically in both yield and quality through improvements in technology and agronomy. The growth of local food and small-scale agriculture has been mind blowing and encouraging. Canada is a global leader in renewable energy. Their crops are the best choice for the world. Canadian farmers are producing a lot of food at a low cost, and very efficiently. Their ability to help feed a rapidly growing, increasingly affluent global population, can create economic opportunities in Canada. Canadian agricultural products are known for their high quality, safety, and sustainability. Other benefits include the following [6, 10]:

- **Environmental Protection:** The major environmental concerns raised about the agriculture sector are the excessive use of fertilizers and the intensive use of pesticides. From an environmental perspective, Canada's agricultural sector is world class. Canada's agriculture sector should be proud of its environmental performance. Canadian farmers do more to protect and preserve the environment than almost anyone else.
- **Sustainable Agriculture:** While there is need to produce more food, food needs to be produced more sustainably. Canada's key advantage is that it is a leader in sustainable food production and processing. Farms in Canada are increasingly transitioning toward sustainable practices. Using satellite data fosters the development of sustainable agriculture and helps farmers better manage resources such as water, pesticides, and fertilizer. Canada's reputation for environmental stewardship can lead to increased demand and price for our products.
- **Precision Agriculture:** This essentially uses data-gathering technologies (like drones, satellite imagery, and sensors), analytics and precise application control to optimize the use of farm inputs. Canadian companies are playing a leading role in the development of new and better precision agricultural technologies that benefit producers in Canada and around the world. The shift to precision agriculture appears to be on a solid track for future growth and mainstream adoption.
- **Exportation:** International trade in Canadian agricultural products has been the single largest driver of the health of the Canadian agriculture industry. Canada is one of the largest agri-food and seafood exporters in the world. The success of the Canadian agriculture sector depends largely on its ability to export to other nations. The United States is Canada's top trading partner, accounting for about 60% of all our agri-food and seafood exports. China has been Canada's second leading agri-food and seafood export market.
- **Women Farmers:** Men account for 72.5% of Canadian farmers, while women account for 27.5%. Female farm operators play a pivotal role in Canadian agriculture. Their tireless work ethic, leadership skills and organizational expertise are shaping the landscape of the agriculture industry across Canada. Female farm operator numbers are reflected in the face of the modernization and adaptation of the agriculture industry. Figure 7 shows a woman farmer [11].
- **Sacredness:** Canadian agriculture manages to command a degree of sacredness that even the Pope would envy. If

agriculture was truly opened to market forces, there would be outrage. It would be chaos. The government protects agriculture through various measures.

Challenges

Some changes to agriculture in Canada have been met with open arms. Others, not so much.

Only about 7% of Canada's land is suitable for farming. The remainder has been created as an urban environment or is extremely difficult to cultivate. Farmland is an indispensable resource for Canada's economy and food security, and needs to be managed and protected. Canadian agriculture is confronted with numerous challenges. Crop protection, climate change, labor, soil conservation, and health are just a few of the problems at hand. Agriculture section needs to worry about flood, drought, heat, frost, rain, grasshoppers, rising input prices, mice, hail, and crop disease. Few people could afford to get into farming today, unless they inherit the family farm. There are too many regulatory bodies and rules that tend to discourage farming. Agricultural practices are evolving and Canadian farmers need constant updating. Other challenges include ^[1, 12, 13]:

- **Climate Change:** This is already affecting global agriculture productivity, and Canada will need to adapt. Farming produces greenhouse gases (e.g., from tractors and livestock) that contribute to climate change. Farmers' carbon reduction methods include more efficient barns and no-till cropping practices. They also use precision farming to consume less tractor fuel. Some new technologies also help farmers reduce their use of fuel, heat, and electricity. Heat, drought, flooding, and disease are examples of natural hazards to farming. Heat is an important factor because it tells farmers the crops they can grow in certain areas as well as how long it will take to grow these crops.
- **Environmental Risk:** Canada's agriculture industry is growing, so too is the environmental risk from increasing greenhouse gas emissions and other impacts. That's where precision agriculture comes in, optimizing farm management practices and input use, and ultimately benefiting both crop production and the environment.
- **Public Trust:** There is a concerning trend emerging around food trust among Canadian consumers. The general public's trust on the Canadian agricultural sector has eroded. The federal government's Standing Committee on Agriculture and Agri-Food has undertaken a study on the public perception of the Canadian agriculture sector. The aim is to probe and analyze challenges steps taken by both industry and government to build public trust.
- **Food Demand:** It is becoming increasingly hard for global food supply to keep pace with demand. Farms are on the front lines of climate change. As much as Canada's ability to meet the increasing need for sustainable food creates significant opportunities, there are challenges standing in the way of it delivering its full potential. As food demand is growing, so is competition. Competition also applies to people and agriculture struggles to attract and maintain the workforce it needs.
- **Labor Shortage:** Skilled labor shortage in agriculture is potentially undermining Canada's research capacity. Canadian farmers are under pressure to produce more food. More laborers are desperately needed on Canadian farms. Some Canadians do not want to work on farms.

Most agricultural work is seasonal, but most Canadians prefer year-round employment. As a result, agricultural producers have been hiring temporary employees from other nations.



Fig 7: A woman farmer ^[11]

Conclusion

Agriculture is a significant primary industry in Canada. It is complicated, interconnected, diverse, and ever-changing. With growing global demand for food and agricultural products increasing, Canada must continue to support agriculture sustainability, innovation, and growth. Canadian agricultural producers are at the cutting edge in the field. It is still a great time to be a farmer in Canada.

Managers in agriculture are in demand in all 11 of Canada's provinces and territories. As a highly-skilled professional, you may be able to secure a Canadian Permanent Residency Visa either with or without a job offer. Most manager in agriculture jobs in Canada are advertised online on jobs sites. They are usually responsible for growing crops raising and breeding livestock poultry and other animals and marketing farm products ^[14]. More information about agriculture in Canada can be found in the books in ^[15-20].

References

1. Headey DD. The evolution of global farming land: facts and interpretations. *Agricultural Economics*. 2016;47(S1):185-96.
2. Hiranandani V. Sustainable agriculture in Canada and Cuba: A comparison. *Environment, Development and Sustainability*. 2010;12:763-75.
3. Veeman TS, Gray R. Agricultural production and productivity in Canada. *Choices*. 2009, 24(4).
4. OECD Food, Agriculture and Fisheries Papers. *Agriculture in Canada*, <https://www.canadaaction.ca/agriculture>
5. Russell PA. *How agriculture made Canada: Farming in the nineteenth century*. McGill-Queen's Press-MQUP; c2012.
6. Council of Canadian Academies. *Expert Panel on Sustainable Management of Water in the Agricultural Landscapes of Canada. Water and agriculture in Canada: Towards sustainable management of water resources*. Council of Canadian Academies; c2013.
7. Frost K. In *Wikipedia, The Free Encyclopedia*. Retrieved; c2022. p. 10.
8. Thompson S, Thapa K, Whiteway N. *Sacred harvest, sacred place: Mapping harvesting sites in Wasagamack*

- First Nation. *Journal of Agriculture, Food Systems, and Community Development*. 2019;9(B):251-279.
9. Kukucha C, Luu J. Sacred Cow? Canada's Response to the BSE Crisis: Evaluating North American Integration, Science, and Questions of Intrusiveness and Autonomy. *Canadian-American Public Policy*. 2007;1(70):1.
 10. Lemay MA, Radcliffe J, Bysouth D, Spring A. Northern food systems in transition: The role of the emerging agri-food industry in the northwest territories (Canada) food system. *Frontiers in Sustainable Food Systems*. 2021;5:661538.
 11. Hart M. Canadian engagement in the global economy. *A Canadian Priorities Agenda: Policy Choices to Improve Economic and Social Well-Being*; c2007.
 12. Rathore D. 44 Canadian agriculture facts that every farmer should know; c2022. <https://kidadl.com/facts/canadian-agriculture-facts-that-every-farmer-should-know#:~:text=44%20Canadian%20Agriculture%20Facts%20That%20Every%20Farmer%20Should,2009.%20..%204%20Facts%20About%20Canadian%20Agriculture%20>
 13. Balmer JE, Morris AD, Hung H, Jantunen L, Vorkamp K, Rig t F. Levels and trends of current-use pesticides (CUPs) in the arctic: An updated review, 2010–2018. *Emerging contaminants*. 2019;5:70-88.
 14. Hennebry JL, Preibisch K. A model for managed migration? Re-examining best practices in Canada's seasonal agricultural worker program. *International Migration*. 2012;50:e19-40.
 15. R Russell. *North America, Its Agriculture and Climate: Containing Observations On The Agriculture and Climate of Canada, The United States, and The Island of Cuba*. Edinburgh: A. and C. Black; c1857.
 16. PA Russell. *How Agriculture Made Canada: Farming in the Nineteenth Century*. McGill-Queen's Press-MQUP; c2012.
 17. Troughton MJ. *Canadian Agriculture*. Akademiai Kiado; c1982.
 18. GDV. Williams *et al.*, *Estimating Effects of Climatic Change On Agriculture In Saskatchewan, Canada*. Kluwer Academic Publishers; c1988.
 19. Jones RL. *History of Agriculture in Ontario 1613-1880*. University of Toronto Press; c1946.
 20. Skogstad G. *Internationalization and Canadian Agriculture: Policy and Governing Paradigms*. University of Toronto Press; c2008.