

5G could increase agriculture GDP in Canada by \$2.7 billion to \$3.5 billion, while reducing the industry’s carbon footprint by at least 10%.

5G Impact on Agriculture

The agriculture and agri-food industries, including primary agriculture, processors, retailers, wholesalers and foodservice providers, account for 7% of Canadian GDP, employ 2.1 million people, and provide 1 in 9 jobs in Canada.

The primary agriculture industry, which accounts for one quarter of total sector GDP, will need to evolve rapidly over the next few years to meet the demands of global population growth and food security needs, and to adapt to climate change.

Put simply, the agriculture sector needs to increase output to meet domestic and foreign demand while reducing its carbon footprint and other environmental effects such as negative impacts caused to watersheds and soil quality, and becoming more resilient to climate change. Meanwhile, input costs are on the rise and there are constant pressures for alternative uses for Canada’s agricultural land.

Without access to 5G and connectivity, especially in rural areas, Canada’s agriculture industry will be unable to meet these challenges – from improving yields to reducing GHGs. The following are potential 5G solutions for the primary agriculture industry and the key benefits they bring.

	Benefits			
	Improves farm productivity	Reduces carbon footprint	Reduces environmental impact	Improves climate change resiliency
Smart irrigation systems to optimize water use	●	●	●	●
Variable-rate technologies to optimize application of fertilizer and crop protection, and seeding	●	●	●	●
Smart buildings applications to optimize energy use	●	●		
Auto-guidance of farm machinery using GPS to optimize fleet use	●	●		
Predictive analytics to reduce machinery downtime and maintenance costs	●	●		
Real-time monitoring of livestock to improve health management of herds	●			●

Research reviewed for this report suggests leading-edge smart technologies could increase global farmland productivity by 6%, add an estimated US\$500 billion to global GDP by 2030 (a 7% to 9% improvement), and reduce fossil fuel use by 16%. Extrapolating to Canada, **5G and 5G-related technologies could add CAN\$2.7 billion to \$3.5 billion to the GDP of Canada’s**

agricultural sector. A case study reviewed for the report found that precision application technologies could reduce pesticide use in the canola industry in Canada by up to 85%.

5G offers benefits to the broader agri-food industry. For example, smart labelling and packaging could reduce food waste, while fridge and bin technologies could divert what does spoil from landfills to recycling options such as animal feed or compost.

According to the Intergovernmental Panel on Climate Change (IPCC), between 21% and 37% of total global GHG emissions are attributable to the food system, including up to 14% from activities that occur on the farm, 14% from land use changes, and 10% from supply chain issues, notably from food loss and waste. In Canada, **mobile wireless technologies, including 5G, applied to the primary agriculture industry could abate 10% of the industry's emissions, or almost 2% of Canada's total emissions.**

Policy recommendations

- ❖ Cultivate digital innovation in the sector by supporting collaborations between farmers, technology providers, and research institutions and by creating a national strategy for the adoption of technologies in the agriculture and agri-food sectors.
- ❖ Support the reskilling of the agriculture workforce for the digital economy through training programs designed for the agriculture sector, driven by provincial government investment in university and college programs.
- ❖ Measure, track, and report on the subscription of 5G services to demonstrate the quantitative linkages between 5G use and the sector's performance. This includes supporting efforts to develop detailed map overlays of connectivity levels and different farm regions and types.
- ❖ Create a recurring technology adoption fund that enables agriculture and agri-food businesses of all sizes to adopt and upgrade technologies. Actions towards improving soil health, food traceability, waste reduction, or quantifying emissions reduction can be targeted to meet government and industry policy outcomes.

Sources used to inform the figures in this brief are:

- Goedde, L. et al. *Agriculture's Connected Future: How Technology can Yield New Growth*. McKinsey & Company, 2020.
- Accenture. *Accelerating 5G in Canada: The Role of 5G in the Fight Against Climate Change*. 2020.
- Farrpoint. *Digital Policy and Climate Change Canada Study Report*. 2022
- Intergovernmental Panel in Climate Change. *Special Report: Special Report On Climate Change And Land*. 2019.
- Agriculture and Agri-Food Canada
- Statistics Canada



Deetken Insight was commissioned by TELUS to complete a comprehensive review of published research about 5G and its potential socio-economic impacts, with a particular focus on Canada. This brief is based on that report. Access the full report including a bibliography here: <https://deetken.com/socio-economic-impacts-of-5g/>. We provide no opinion, attestation, or other form of assurance with respect to the completeness, accuracy, fair presentation, and findings from research of others that are presented in the report.

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