

Briefing Note

DIGITAL AGRICULTURE AS A CATALYST FOR CANADA'S NATION-BUILDING PRIORITIES

This document is meant to raise awareness among policymakers — especially those outside the agri-food sector — about the need to leverage digital agriculture to address critical challenges Canada faces involving innovation, national security, economic growth and sovereign capability. For questions, comments or to discuss opportunities for collaboration, email kvolpihiebert@emilicanada.com.

Executive Summary

Canada's agri-food system, valued at over \$149 billion and employing some 2.3 million people, is a foundational engine of our national economy. However, the sector is also now navigating an era of major volatility. Market turmoil and fragmentation, climate change, geopolitical instability, demographic transition and huge technological shifts are all having interrelated impacts.

One solution to boost the sector's productivity and resilience amid these dynamics lies in accelerating the adoption of [digital agriculture](#). This involves the use of tools such as AI, automation, satellite imaging, field-based sensors and data-

driven platforms. Yet often overlooked is how doing so can also be a catalyst for addressing some of Canada's broader areas of need.

Rather than being viewed as merely another economic sector, agriculture should be harnessed as a core strategic asset and pathway to Canada becoming a global technology powerhouse. If this change in mindset can gain traction among policymakers, both Ottawa and the provinces have a higher likelihood of achieving several other intersecting goals. Among them: building sovereign industrial capacity, driving productivity growth and fortifying supply chains.

Many of the concepts and ideas laid out in the *AI For All* strategy and the National Food



Security Strategy — and the Defence Industrial Strategy — touch upon this possibility. The same is true for numerous provincial initiatives. Plus, meeting Canada's obligations under NATO's [Article 3](#) on national resilience and civil preparedness.

Still, there's a risk these ambitions go unfulfilled. Without concerted effort by different departments at different levels of government to affix greater importance to agriculture within Canada's other nation-building priorities, the country will continue to underutilize one of its chief sources of innovation and competitive advantage in the digitized, 21st century global economy.

1 | Strategic Context: Nation-Building and Global Disruption

The Government of Canada has identified several critical priorities for the coming decade. These include maintaining national sovereignty in a fractured global landscape and ensuring safe and trusted AI adoption. Plus, mitigating structural food inflation and reversing lagging national productivity.

The digitization and modernization of the agri-food value chain directly intersects with all these mandates.

Recent disruptions — lingering effects of the COVID-19 pandemic, extreme climate events, animal disease risks, a surge in cybercrime and politically motivated cyberattacks, as well as worsening trade uncertainty — have proven that vulnerabilities within our food systems are no longer theoretical threats. Rather, they are immediate economic and social risks. Canada's national security is inextricably linked to its ability to feed itself.

An added upside is that returning to a historical agricultural productivity growth rate of 2 percent per year could [add \\$30 billion](#) in new agricultural revenue over the next decade. And as a top-tier agri-food exporter, Canada plays a key role in upholding global food security. What's more, Canadian food products are exported to 192 countries around the world — an underappreciated form of connection and gateway to diplomacy to the rest of the world.

2 | Agriculture as a Catalyst for Broader National Priorities

2.1. Technological Innovation, AI Trust and Adoption

Canada's national AI strategy identifies agriculture as a priority sector where scientific, economic and industrial strengths converge. The deployment of AI in agriculture — such as predictive analytics for yield forecasting, precision spraying and automated harvesting — provides a highly tangible means to [build public trust in AI technologies](#) and raise awareness of their benefits.

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Building producer trust will require clear rules for data ownership, privacy, interoperability and AI ethics. And these must be supplemented by practical data-literacy resources. Initiatives such as [Ag Data Transparent](#), of which EMILI is a key supporting member, provide a foundation for this work by helping producers understand how farm data is collected, stored, shared and used.

These efforts could inform the development of an "Ag Data Trustmark" certification and a Pan-Canadian Agricultural Data Governance Framework, while also addressing broader questions about Canadian compute capacity, data sovereignty and the impacts of AI infrastructure on rural communities.



Scaling digital agriculture will also require resolving persistent adoption barriers. Factoring into the decision by any producer or agribusiness to adopt new technology are high upfront costs, uncertain returns on investment, rural connectivity gaps, limited interoperability and access to technical support. Progress around these enabling conditions is necessary to move promising technologies from successful demonstrations to widespread adoption.

By treating farms and processing facilities as critical infrastructure, Canada can build robust, human-centered cyber resilience across the entire food value chain.

2.2. Food Security, Sustainability, and Sovereignty

Canada relies heavily on imports for fresh fruit and vegetables, exposing consumers to global supply chain shocks and climate-driven price inflation. Digital agriculture can directly mitigate these vulnerabilities. The integration of AI and automation within Controlled Environment Agriculture (CEA) allows for year-round domestic production, including for specialty produce. Federal investments in CEA will drastically reduce reliance on imports and lower the energy and labour costs associated with indoor farming. Furthermore, precision technologies optimize land use and reduce fertilizer application, aligning with national

sustainability targets while shielding the food supply from geopolitical disruptions.

2.3. Cybersecurity and Critical Infrastructure Defence

As food systems digitize, they become highly susceptible to criminal ransomware, intellectual property theft and state-sponsored disruptions. Agriculture intersects with finance, transportation, energy, and public health, making its cyber vulnerabilities a matter of national security.

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2.4. Productivity Growth and Drawing Greater Investment

While Canada is a global leader in early-stage agtech research and intellectual property creation, it suffers from a systemic venture capital gap at the commercialization phase.

To turbocharge the development of productivity enhancing tools, Canada must deploy dedicated growth-stage capital to prevent promising domestic firms and entrepreneurs from relocating abroad — something the CEO of Build Canada recently [called](#) a “five-alarm fire.” Reversing this situation is vital to keeping intellectual property and economic value within Canadian borders.

2.5. Labour, Skills Development and the STEM-Driven Farm

It is critical to challenge outdated perceptions of agricultural work. Modern farming is a highly advanced, STEM-based profession requiring deep expertise in agronomy, finance, chemistry, meteorology, data science and risk management. In essence, it has become akin to advanced outdoor manufacturing. A digitized food system thus requires a digitally fluent workforce.

The food system also supports social stability, emergency preparedness, trade relationships and Canada's role as a reliable global ally.

As Canada faces a [major demographic transition in farm ownership](#), the next generation of producers must have access to the tools, knowledge, and training required to operate technologically advanced farms. Still, Canada is already dealing with a deficit of workers with the necessary skills to integrate AI and data analytics into daily producer operations.

By supporting digital agriculture courses and learning opportunities — while highlighting agriculture as a meaningful career pathway for recent graduates and

and existing professionals in computer science, IT and cybersecurity — provinces and the federal government can both boost the skills of the sector itself while hastening the flow-through rate of vital digital skills within the broader economy.

3 | Agriculture as a Core Pillar of the Defence Industrial Strategy

3.1. Food Security is National Security

While agriculture is not explicitly named in the Defence Industrial Strategy, the plan's core themes apply directly to the agri-food sector.

Whether it's sovereign capability, supply chain resilience, domestic production capacity or preparing for disruptions, agriculture must be recognized as a strategic asset on par with defense, critical minerals, energy, and cybersecurity.

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Image credit: NATO under [CC 4.0](#).

NATO's Article 3 Commitments: Civil Preparedness and Food Security

Civil preparedness is foundational to NATO's strategy for credible deterrence and defense. Article 3 of the alliance's founding treaty commits all member states to continuously maintain and develop their individual and collective capacity to resist an armed attack. This means each country must be resilient enough to withstand and quickly recover from major shocks — be it natural disasters, critical infrastructure failures or hybrid warfare.

Military forces rely heavily on commercial sectors and capabilities to fulfill their missions. Without strong civilian infrastructure, military operations become vulnerable. To help measure and guide this

readiness, NATO has established seven baseline requirements for national resilience. Among them is the maintenance of resilient food and water resources.

For both military forces and civilian populations to survive and operate effectively during a crisis, secure access to basic sustenance is essential. Under their Article 3 commitments, member states must ensure that their local food production, agricultural supply chains and water systems remain safe from sabotage or systemic disruption. By fortifying domestic food production and securing these critical supply lines, NATO countries guarantee they can seamlessly support their armed forces and protect their citizens through any potential crisis or conflict.



3.2. Sovereign Capability and the "Missing Middle"

Canada produces massive quantities of agricultural commodities but suffers from gaps in value-added domestic processing capabilities. Too often, raw commodities such as soy and grain are exported for crushing and milling, only to be imported back into Canada as value-added ingredients, animal feed, and biofuels like sustainable aviation fuel.

This reliance on external processing diminishes sovereign capability. Strengthening domestic processing infrastructure is thus essential for food security and trade diversification. Other significant spillover benefits are rural economic development and added resilience within domestic supply chains.

3.3. Critical Farm Inputs and Systemic Vulnerability

Canada is also heavily dependent on imported agricultural inputs. Modern farming relies on global supply chains for fertilizers, crop protection products, veterinary antibiotics, seeds and advanced machinery.

Disruptions to these critical inputs — whether through geopolitical conflict or logistical failure — can immediately and severely restrict Canada's production capacity. Establishing a critical farm input strategy and conducting a system-wide vulnerability assessment are vital steps to identifying and mitigating exposure points that could be weaponized by adversaries.

3.4. Dual-Use Technologies and Commercialization

The Defence Industrial Strategy's focus on moving from research and development to commercialization, procurement and scale-up perfectly mirrors the innovation challenges within agriculture. Canada boasts strong agricultural research capacity but frequently struggles to deploy and sustain commercially adopted solutions.

There are significant opportunities in dual-use technologies that serve both agricultural and defense purposes. Commercial innovations in artificial intelligence, remote sensors, automated drones, cybersecurity, batteries, traceability and biosecurity must be prioritized to bolster national resilience.

The infrastructure to trial and help scale-up these tools is already in place.

EMILI and the [Agriculture Innovation and Adoption Network \(AIVA\)](#) offer existing platforms to help identify, test and validate mature dual-use technologies in Canada's agriculture sector, advancing their development with the potential for broader deployment.

By offering real-world testing environments in different geographies and regions, this partnership can generate trusted performance evidence, reduce adoption risks and support the commercialization and scale-up of Canadian-made solutions and key sovereign capabilities.



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Conclusion | The Need for Whole-of-Government Coordination

Canada achieving sovereign resilience and capitalizing on the digital transformation of agriculture requires a cohesive, whole-of-government approach. Ultimately, if the country is going to meet its nation-building objectives in a more unstable and hostile world in the coming decades, agriculture can no longer be siloed off on its own.

Instead, it requires coordinated planning across Agriculture and Agri-Food Canada, Health Canada, Environment and Climate Change Canada, Innovation, Science and Economic Development Canada, Transport Canada, Public Safety Canada, the Department of National Defence, Global Affairs Canada and their provincial counterparts.

Embedding agriculture experts in diverse departments outside of agriculture and having them connect and coordinate more closely with private sector agribusinesses and non-governmental stakeholders would be a laudable first step.

By recognizing the agri-food sector as a core pillar of our sovereign capability, policymakers can transform it into a premier showcase of Canadian innovation, sovereignty and global leadership.



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Get in touch

For questions or comments, or to discuss opportunities for collaboration, contact EMILI's Manager of Public Policy & Stakeholder Engagement, Kyle Volpi Hiebert at kvolpihiebert@emilicanada.com