



INNOVATION IN ACTION

REPORT

2026

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AIVA – the Agriculture Innovation, Validation, and Adoption Network – brings together farmers, innovators, and validation hubs to accelerate proven technologies to market and derisk adoption. AIVA is a national network focused on turning promising agriculture technologies into proven tools that deliver real results on Canadian farms. By connecting those who build agtech with the farms that test it and the farmers who adopt it, AIVA helps reduce the risk of technology adoption while improving efficiency, resilience, and profitability on Canadian farms.

AIVA was founded by FCC, EMILI, and WHIN.



This report offers a snapshot of the rigorous testing already underway across the AIVA Network to trial promising agriculture technology. Through **AIVA's Validation Model** (pg. 5), early-stage technologies are assessed in real farming environments, generating practical, unbiased insights that innovators can use to refine their product. In this report, you'll find early results from trials of an **autonomous weeding robot** (pg. 7) and a portable device enabling **in-field crop nutrient analysis** (pg. 11), along with perspectives on emerging opportunities such as **spray drones** (pg. 9) and monitoring **Nitrous Oxide emissions** (pg. 13). For innovators with market-ready solutions, the report also introduces

AIVA's Adoption Model (pg. 5) which pilots technologies alongside Canadian farmers to evaluate real-world performance, usability, and return on investment.

The AIVA Network is made up of people from across the agriculture industry, including farmers, corporations, academia, accelerators, and more. Together, this ecosystem is working to close the gap between innovation and adoption to ensure proven technologies reach the farm.

Learn how to **join the AIVA Network** on page 14.

Thank you for your interest in the AIVA Network.



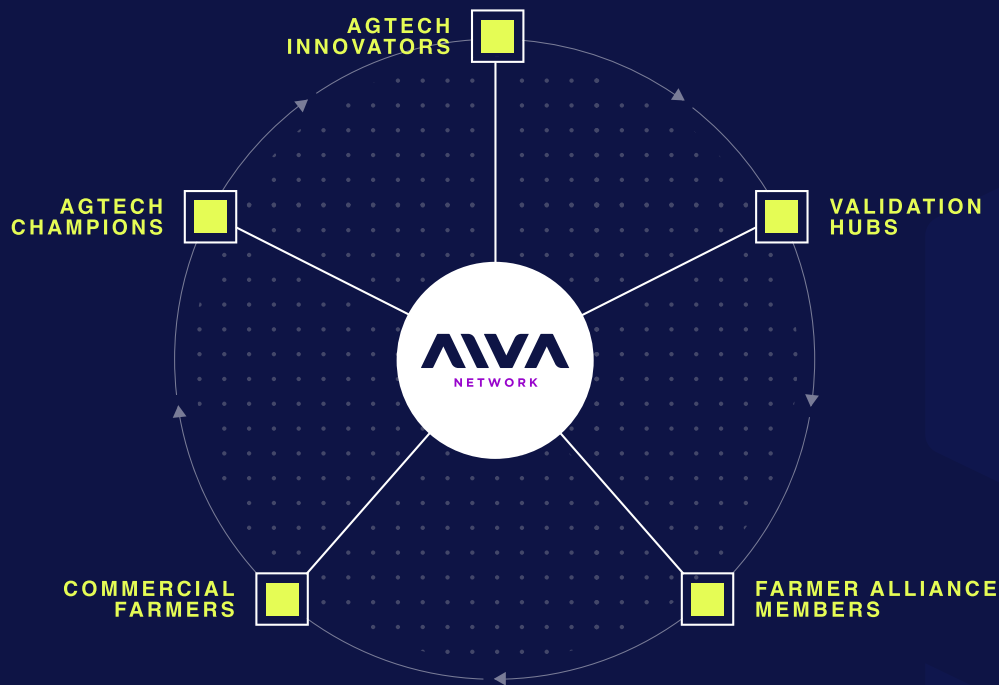
THE OPPORTUNITY

Canada has a long and well-earned reputation for agricultural innovation, but today investments and pilots are fragmented, and too many promising technologies stall before they ever reach the farm.

At the same time, farmers face the challenge of identifying solutions they can trust. With limited time and growing risk, farmers need proven technologies that perform under real conditions and deliver measurable value.

AIVA was created to close that gap.

This report highlights how technologies move through AIVA, what is learned along the way, and why that process matters. These projects are part of a broader model designed to reduce uncertainty, surface meaningful insights, and accelerate adoption across Canadian agriculture.



A STRUCTURED PATH

FROM TRIAL TO ADOPTION

Agricultural innovation succeeds when ideas are tested, refined, and proven under real conditions with results farmers can trust.

The following sections outline how AIVA's solution works and why it provides a clearer, more credible path from trial to impact.



AIVA'S VALIDATION MODEL

The Validation Model focuses on early-stage technologies with the potential to deliver meaningful value on Canadian farms. Through AIVA's network of **Validation Hubs**—applied innovation and demonstration farms operating in real production environments—technologies are tested using standardized frameworks that allow results to be compared across regions, crops, and conditions. With this feedback, **Agtech Innovators** can then refine their product to prepare it for commercial deployment.

AIVA is proud to bring together a growing group of Validation Hubs across Canada that have been testing and validating new technologies at scale for years, and we are grateful to our partners at **Area X.O**, **EMILI**, **Innovation Farms Ontario**, and **Olds College**. Together, AIVA's Validation Hubs offer Agtech Innovators over 19,500 acres of farmland with more than 15 varieties of crops such as grain, vegetables, potatoes, fruit trees, and more.

ONTARIO



ONTARIO



MANITOBA



ALBERTA, SASKATCHEWAN



19,500+

ACRES OF FARMLAND

15

VARIETIES

4

PROVINCES



AIVA'S ADOPTION MODEL

Once a technology is ready for commercial evaluation, it enters AIVA's Adoption Model. Here, market-ready solutions are piloted with **Farmer Alliance Members**, who are a group of Canadian farmers who test technologies within their own operations and provide structured feedback using AIVA's standardized testing frameworks.

This phase focuses on real-world performance, usability, and economic value and can be applied to any technology, anywhere in Canada. Farmer Alliance Members help to identify the technologies that demonstrate tangible economic and operational benefits in real-world conditions. For innovators, this provides proof of scalability. For farmers, it offers purchasing confidence grounded in peer-led testing. AIVA's Farmer Alliance Members currently includes 19 farmers totaling over 176,000 acres of farmland, with 64 technologies being considered.

176,000

ACRES OF FARMLAND
Southern Manitoba & Saskatchewan

19

TOTAL FARMERS

64

TECHNOLOGIES BEING CONSIDERED



AREA X.O

Ottawa Innovation Farm at Area X.O is a secure, technology-enabled demonstration facility testing and validating agtech in real-world field conditions. The facility combines small-plot and mid-sized fields with advanced technologies such as robotics, drones, connectivity, and AI. Area X.O supports solutions that address critical sector challenges, including climate adaptation, labour efficiency, and food system resilience, while enabling early consideration of regulatory pathways during trials.

OTTAWA, ON

Total Acreage

120+ ACRES

Crops

[Corn](#)[Soybean](#)[Wheat](#)[Pumpkins](#)[Horticulture](#)

REAL-WORLD TESTING CONDITIONS

- Zone 5b
- Characterized by cooler, shorter growing seasons
- Soil variability for broad testing
- Mid-size broad crop fields and small-plot demonstration fields

TESTING CAPABILITIES

- Autonomous agricultural robots
- Uncrewed Aerial Systems (UAS)
- Biological testing
- Private 4G/5G networks and connected infrastructure for IoT and remote operations
- GHG Emissions Testing
- Environmental monitoring with weather stations, pheromone sensors, and soil probes
- High-Resolution Soil Mapping
- Command Centre Integration (live dashboard views for remote data access)
- Integrated data systems for trial performance and AI-ready datasets
- Humanoid in development



AUTONOMOUS AGRICULTURE



COMPANY & TECHNOLOGY

Naïo Technologies **ORIO robot**

VALUE & IMPACT

Pumpkin production and other horticultural crops are highly labour-intensive, requiring frequent and time-sensitive field operations such as weeding. Labour availability and cost remain ongoing challenges for growers. Building on strong results from a previous project using a smaller autonomous robot at Area X.O, this project evaluates **a larger autonomous platform** capable of operating at commercial field scale. The goal is to determine whether the benefits of autonomous weeding can be extended from small plots to full-scale horticultural production.

KEY FINDINGS

The project includes both small-plot trials and testing in a commercial pumpkin field of approximately 50–70 acres. Early feedback has been positive, building on prior experience with smaller robots and helping assess whether larger platforms can reliably deliver value at increased scale.

BENEFITS TO FARMERS

This project supports informed adoption by demonstrating how autonomous weeding systems can integrate into real horticultural operations, reduce labour pressure, and improve operational efficiency in pumpkin production and other labour-intensive crops.

FUTURE PROJECTS

A key focus for future work is closing the gap between promising technology and real-world adoption. Priority will be given to solutions designed with adoptability in mind, including minimal setup, clear and timely decision support, interoperability with existing equipment, and rapid demonstration of value. Understanding adoption barriers such as usability, trust in data, time constraints, and fit with existing practices will be central to future trials.



EMILI is an industry-led non-profit committed to driving agriculture innovation, partnership, and engagement. They provide innovators access to leading-edge equipment, technology, and production practices to increase productivity, sustainability, and profitability across the agriculture and agri-food sector.

GROSSE ISLE, MB

MACGREGOR, MB

Total Acreage

**15,000+
ACRES**

Crops

Grain and oilseed farm
(Grosse Isle, MB)

- Spring/winter wheat**
- Oats** **Barley**
- Corn** **Canola**
- Soybeans** **Field peas**
- Forage peas**

Potato and grain farm
(MacGregor, MB)

REAL-WORLD TESTING CONDITIONS

- ~2650-2700 CHU (Corn Heat Units)
- 1,686-1700 GDD (Growing Degree Days) above 5°C
- 348-360 mm precipitation
- Avg date of last spring frost: May 19-23
- Avg date of first fall frost: Sept 22-28
- 122-130 frost-free days
- Black chernozemic soil developed on fine, clay-textured materials
- Chernozem soil, including Firdale soils developed on moderately to strongly calcareous, deep, fine loamy lacustrine deposits, and Halstead soils developed on weakly calcareous, deep, stratified, coarse loamy and coarse silty lacustrine deposits

TESTING CAPABILITIES

- Potato storage bins
- Irrigation systems
- Scouting and agronomic data collection
- In-house drone imagery
- 5G Network
- Commercial farm equipment
- 10+ years farm management data
- 6,300 square foot workshop
- Large event space and boardroom with AV for presentations and hybrid meetings
- Command centre w/three 55" TV screens
- 50+ remote monitoring sensors
- Field imagery (NDVI, SVI, RGB), yield maps, harvest protein quality, fertilizer prescription maps, electrical conductivity maps, elevation maps and more (subject to individual fields)



SPRAY DRONE TRIALS



COMPANY & TECHNOLOGY

Corteva Agriscience **spray drones**

VALUE & IMPACT

Currently, no pesticides are approved for drone application in Canada. Field trials at EMILI's Innovation Farms are generating data that could support future registration of **two fungicides** and **one herbicide** for spray drone application. This project is establishing research methodologies to better understand product performance when applied by drones and represents an important step toward broader adoption of spray drones in Canadian agriculture.

KEY FINDINGS

Results are in progress, but drone-based spraying may support precision agriculture by reducing crop damage from heavy equipment and enabling more efficient, targeted applications.

BENEFITS TO FARMERS

Over time, spray drones could improve sustainability, efficiency, and innovation across the sector.



7 FUTURE PROJECTS

EMILI's Innovation Farms will continue to focus on enabling farmer-centric innovation, advancing sustainable technologies and techniques, and increasing digital agriculture skills and knowledge. The MacGregor site prioritizes potato storage solutions, disease management, and irrigation optimization. The Grosse Isle site emphasizes sustainability and efficiency, including reducing fertilizer use while optimizing crop yields.



INNOVATION FARMS ONTARIO

Powered by AgExpert 

Innovation Farms Ontario is a network of Ontario farms providing practical research and farm testing on new technologies such as automation, robotics, and sustainability.

 HAGGERTY CREEK
LTD, BOTHWELL, ON

 NIAGARA VINEYARDS,
BEAMSVILLE, ON

Total Acreage

2,100+ ACRES

Crops

Rye

Corn

Onions

Grapes

Soybeans

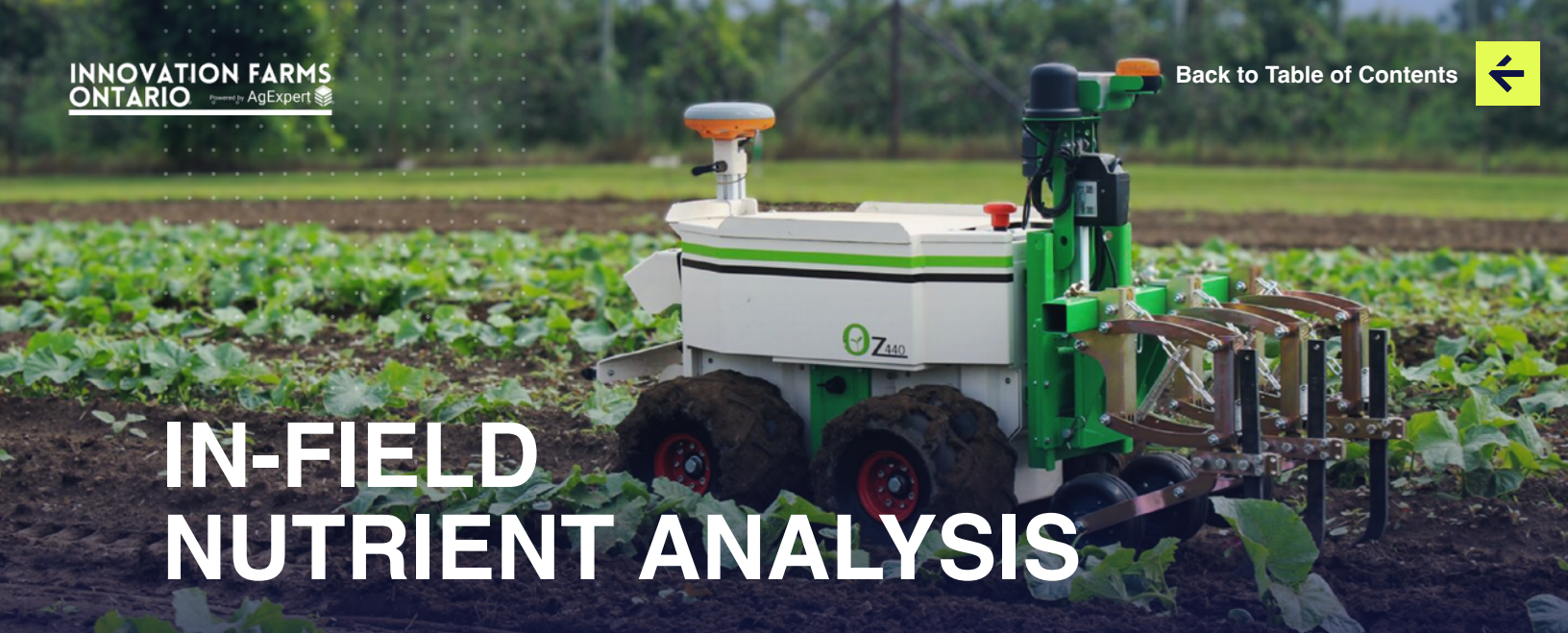
REAL-WORLD TESTING CONDITIONS

- Zones 5b & 6a
- Characterized by a humid continental climate, no dry season, and a warm summer climate
- Soil types include Berrian sand (Bothwell), Oneida, and Chinguacousy loamy phase (Beamsville)
- Grow season from April to October

TESTING CAPABILITIES

- All farm activities are recorded in FCC's AgExpert, supporting cost tracking, input management, and sustainability tracking by field
- Data tracking also includes Climate Field View, Raven Slingshot, JD ops centre
- Analysis: AgVance Sky Mapping by SSI
- AgLeader SMS Advanced





IN-FIELD NUTRIENT ANALYSIS

COMPANY & TECHNOLOGY

Picketa Systems

Leaf Evaluated Nutrient System (LENS)

VALUE & IMPACT

Traditional tissue testing requires lab analysis, often resulting in delayed data that can cause farmers to miss critical nutrient application windows. Picketa's LENS delivers **real-time, in-field nutrient analysis** using scanned leaf samples, enabling timely, data-driven decisions.

KEY FINDINGS

LENS proved easy to set up and use, produced consistent data across comparable fields, and delivered agronomically relevant insights focused

on key nutrients. Data collected in 2024 and 2025 established a strong baseline for ongoing model improvement in winter wheat.

BENEFITS TO FARMERS

Instant results support faster decision-making, improved nutrient timing, increased efficiency, and long-term cost savings compared to traditional lab testing.



FUTURE PROJECTS

Innovation Farms Ontario is interested in advanced automation and data-driven tools to improve efficiency at scale, including automated scouting, precision spraying, harvest logistics, and grain handling. Solutions that reduce labour demands while improving accuracy and timing are a priority.



OLDS COLLEGE

OF AGRICULTURE & TECHNOLOGY

Olds College implements digital agriculture technologies for crop and livestock production to investigate solutions to evolve agriculture practices. Primary research areas include livestock production, crop production, environmental stewardship, smart agriculture, and controlled environment agriculture.

📍 OLDS, AB

📍 CRAIK, SK

Crop and Forage Acreage

**3,000+
ACRES**
plus greenhouse access

Feedlot Capacity

**1,000
HEAD**

Crops

- Canola
- Barley
- Wheat
- Oats
- Peas
- Teff
- Winter Rye
- Perennial Forages

REAL-WORLD TESTING CONDITIONS

Olds College sits on primarily productive black chernozemic soils, typical of the Canadian Prairies.

TESTING CAPABILITIES

Practical and industry-driven applied research is key to accelerating the development and adoption of technologies and practices. The research experts on the Smart Farm work with innovators and SMEs to move their ideas and products through the innovation chain — and into the hands of farmers and producers.





MONITORING NITROUS OXIDE EMISSIONS

COMPANY & TECHNOLOGY

Olds College Centre for Innovation (OCCI)
LI-COR chambers

VALUE & IMPACT

Nitrous Oxide (N₂O) is a greenhouse gas that is emitted from agricultural soil management. OCCI installed eight LI-COR chambers to **monitor N₂O emissions from the soil** to determine if 4R Nutrient Stewardship could help farmers reduce their greenhouse gas emissions.

KEY FINDINGS

Results are still in process, but this data, combined with all data layers collected by

Olds College, will be used to develop and validate models that will predict the impact of practiced changes on the carbon footprint of crop production.

BENEFITS TO FARMERS

Farmers will have a better understanding of which practices actively reduce N₂O emissions to reduce their carbon footprint.



7 FUTURE PROJECTS

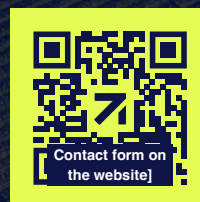
Olds College is always trialling new smart agriculture technologies to evolve agriculture practices. Future work includes advancing autonomous equipment and drone-based solutions for weed and disease management, as well as expanding regenerative agriculture research through cover cropping and marginal land studies.



JOIN THE NETWORK

AIVA wants to scale into a network that benefits and empowers farmers across Canada to adopt technology with confidence to ensure every investment improves on-farm efficiency and profitability.

AIVA welcomes farmers, corporations, academia, accelerators, and more to join us. To receive updates on industry news, technology trials, and how AIVA is accelerating agtech adoption for Canadian farmers, scan the QR code or visit aivanetwork.ca





aivanetwork.ca

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