

Agi3 Crop Sentry station assessment

About the technology: Agi3's Crop Sentry system is an AI driven IoT (Internet of Things) platform that provides 24/7 crop monitoring and analytics. This system powers advancements around farm management, and within the industry, to improve resource use efficiency, and decrease the environmental impact of agriculture. It comes equipped with long-range LiDAR (Light Detection and Ranging) and high-resolution multispectral cameras that provide detailed crop growth and health measurements. The system is able to integrate weather data with wireless soil moisture data up to three kilometres from the base station.

Innovation Farms' Objectives

- Validate the Crop Sentry sensor system's ability to monitor and provide insight into crop performance.
- Test the ability of Crop Sentry to make yield predictions that reflect in-season changes to controlled variables (such as the amount of fertilizer applied).
- Provide data variance to improve Crop Sentry machine learning yield prediction algorithms.

What this technology could unlock

Crop Sentry's 24/7 crop scouting analytics provides the detail needed to establish growing standards and practices that optimize crop growth and harvest in relation to yield and quality outcomes. This will unlock field level risk management for farmers and yield valuable insights to inform Best Management Practices (BMPs).

Our approach

- Installed 15 stations across Innovation Farms, near roadsides and in fields, after planting, including one station in Gypsumville, two hours from Innovation Farms' main location, to analyze remote monitoring capabilities.
- Tested new sensors to open up possibilities for new models and algorithm development.
- Tested advanced precision location and heading techniques across all field locations.
- Shared drone and Crop Sentry imagery with developers to extrapolate accurate, in-season yield forecasts across entire fields.
- Captured multispectral images at key growth stages throughout growing season using a DJI Matrice 300 RTK drone equipped with a MicaSense RedEdge-P camera.

Project collaborators:

EMILI  AGI3

At Innovation Farms powered by AgExpert, EMILI provides innovators across industry and academia with access to leading-edge equipment, technology, and production practices to increase productivity, sustainability, and profitability across the agriculture and agri-food sector.

Innovation Farms project summary last updated: November 5, 2024

What we learned

- This sensor is unique compared to the others we have established on Innovation Farms. It provides daily 360° imagery, direct plant height and growth measurements, and more comprehensive data is extrapolated from the sensors.
- While having sensors installed in-field allows a broader viewpoint, it does create a field obstacle that should be considered.
- The sensor installed at Gypsumville successfully demonstrated Crop Sentry's remote monitoring capabilities, in a location that was two hours away from the main Innovation Farms site.



This Crop Sentry station was installed in a pea field in the spring. It is one of 15 sensors deployed across the farm in 2024.



Innovation spotlight

Crop Sentry has a 360° rotating head equipped with wide and narrow cameras in addition to LiDAR sensors, which allows producers to gain a broader perspective on their field to make informed decisions.

Learn more about Agi3's Crop Sentry sensors

Agi3's Crop Sentry sensors aim to power advancements around farm management (such as identifying problems before they become severe, optimizing time sensitive applications, or reducing inputs), and within the industry (such as plant breeding specific to regional environments) to improve resource use efficiency, and decrease the environmental impact of agriculture. Crop Sentry is an autonomous platform capable of continuous (24/7) non-destructive crop monitoring and analytics.



“Testing in real-world conditions, alongside Innovation Farms' expertise in collecting precise ground truth data, is accelerating our AI/ML model development and unlocking real-time insights that will empower farmers to make data-driven decisions, optimize resource use, and ultimately enhance crop resilience and yield outcomes.

Lysa Porth, Co-founder, Agi3, President and CEO, AIRM Consulting

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