Project Summary

EMILI TerraWave

Updated: October 2026

TerraWave Inventory Management Sensors

About the technology

TerraWave's Inventory Management Sensors are designed to wirelessly monitor fill levels and inventory volumes inside grain bins. This pre-commercial technology uses radar to provide real-time measurements of grain levels, allowing users to maintain an accurate, continuous view of inventory without requiring manual measurements.



Inventory Management Sensors installed in a grain bin at EMILI's Innovation Farms (Photo credit: TerraWave).

EMILI objectives

Throughout 2025-2026, EMILI deployed TerraWave's Inventory Management Sensors in various sized grain bins filled with different commodities at Innovation Farms in order to:

- Test the sensor's ability to provide timely, accurate data on grain inventory metrics across a full-scale farm operation.
- Validate the robustness of the data acquisition unit and communication module.

What we learned

Data and system performance

Comparing Inventory Management Sensor data with weigh scale ticket data from Innovation Farms provided an opportunity to validate TerraWave's sensor and data processing algorithm against real-time grain movement and inventory measurements. This helped build confidence in the accuracy and reliability of the system under actual operating conditions.

User preferences and whole-farm operations

The collaboration between TerraWave and EMILI provided valuable insight into user priorities and how Inventory Management Sensors fit within broader farm operations. User feedback helped inform the development of a user-friendly mobile app for accessible inventory data, while on-farm testing during grain movements identified opportunities for the technology to provide value.

Refining the technology

Testing TerraWave's system in a real farm environment identified opportunities to improve both the hardware and software. On-farm testing helped refine the data processing algorithm to better handle data noise and variability and highlighted the need for a more robust sensor mounting system to withstand extended exposure to varying weather conditions.



What this technology could unlock

TerraWave's Inventory Management Sensors could provide value to producers, agricultural insurers, and commercial grain elevators by providing real-time, independent inventory data. This could improve risk assessment and claims management, reduce reliance on manual measurements, and support more efficient inventory management and workflow.

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