ALBERTA INNOVATES

Clean Resources

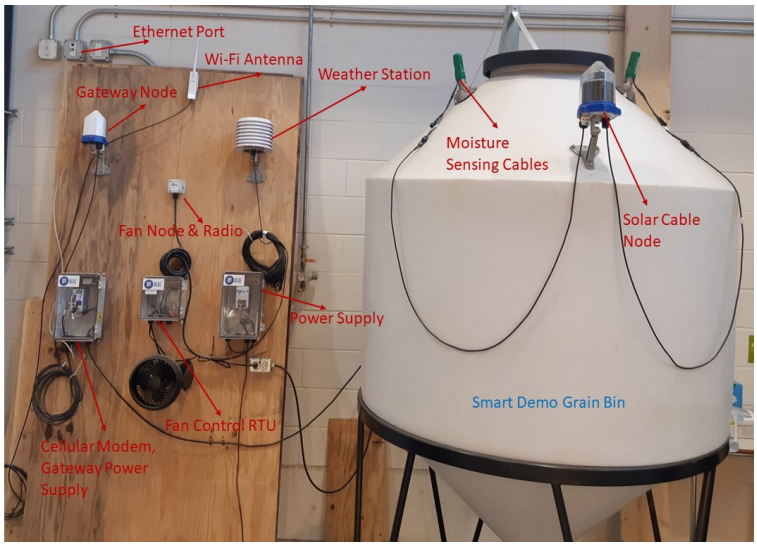
Smart Agriculture and Food Innovation

Smart Agriculture

FUNDING DETAILS

Smart In-bin Grain Storage and Management System for Optimum Quality

Alberta is a major producer of grains (cereals, oil seeds and pulses). Cool temperatures that cause delay in crop maturity, and early snow fall, force farmers to harvest grain in wet conditions, which tremendously increases grain drying costs and spoilage risk during on-farm storage. Grain moisture and temperature are the two most critical factors that affect long-term grain storability. This project tests a smart sensing technology to monitor in-bin grain storage conditions and validates an advanced automated fan and heater control system to dry grain. The smart technology allows wireless monitoring of grain conditions using temperature and moisture sensing cables. The successful validation of these technologies could allow farmers to start harvesting earlier to minimize adverse weather effects and to better manage the in-storage grain with minimum spoilage risk.



RECIPIENT:
Lethbridge College
PI: Dr. Chandra Singh

PARTNERS:
OPIsystems Inc.

TOTAL BUDGET:
$49,950

AI FUNDING:
$49,950

PROJECT DATES:
March 2020 – February 2021

PROJECT TRL:
Start: 5
End: 7

APPLICATION

There is an increasing need for advancing research in post-harvest handling and storage of grains technologies to minimize economic losses. This project will provide access to advanced smart grain management sensing technologies. It will generate “big data” related to real-time artificial intelligence technologies and will enable growers and industry members to make informed decisions about grain management for optimum quality.

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PROJECT GOALS

- Minimize post-harvest losses of crops (cereals, oilseeds, and pulses) by using smart sensing technology in grain storage and handling.
- Develop and validate mathematical models to predict spoilage risk and develop management guidelines, automated fan and heater controls for in-bin aeration and drying of grains using artificial intelligence.
- Develop knowledge transfer plans and demonstration tours to teach the use of smart bin technologies to producers in Alberta.

BENEFITS TO ALBERTA

- Improvement in grain management technology, which may allow early harvest by improving grain storage through quality optimization, moisture control, energy savings, and reduced operating cost. It is estimated that in Alberta, about 10% of total crop is left unharvested, mostly covered in snow and lying flat with nearly zero chance of picking it up. Thus, the validation of these technologies will increase profitability for farmers and the grain industry.
- The smart grain bin will be used as an educational tool for the Agriculture Technology program at Lethbridge College. The practical learning outcome from this project will be a great help in developing skills for grain storage and handling among students, industry members and producers in Alberta.

1 New Product/Service

2 Project Jobs

3 Future Jobs

CURRENT STATUS

February 2021

The team is currently seeking quotes from different bin manufactures for supply and installation of grain bin. Once the bin is installed, we will add sensing cables and automated fan and heater control to the bin. The automated drying bin will be used for benchmarking for another 3-year project co-funded by AI and the Agriculture Funding Consortium.