

CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

FUNDING DETAILS

Centre Pivot Optimization

The project will develop pivot irrigation technologies in two focus areas that are to be field-tested in southern Alberta – IntelliRain proprietary remote sensing technology to sense soil moisture in real time and adjust irrigation requirements accordingly; and a robotic, fully controllable irrigation sprinkler at the end of a centre pivot to irrigate the corners of the field currently not being irrigated.

The project is designed to advance knowledge and technology to enhance agricultural operations leading to sustainable water resource management in Alberta, specifically increased water use conservation, efficiency, and productivity for irrigation acres.



RECIPIENT:

InteliRain Inc.



PARTNERS:

**University of Alberta;
Farming Smarter;
Participating farmers**



TOTAL BUDGET:

\$1,019,200



AI FUNDING:

\$432,000



PROJECT DATE

**March 2021-
March 2023**



PROJECT TRL:

**Start: 7
End: 9**

APPLICATION

The project aims to improve overall water use efficiency by greater than 30 per cent for pivot irrigated crops in southern Alberta. This is based off small-plot testing, research and previous publications on pivot irrigation water use efficiency. It also aims to increase crop yield, for any crop under pivot irrigation, by 17 per cent or more due to appropriate water application. For the pivot irrigation user, the intention at commercialization is for a fully automated system that is easy, economical and encouraging to operate. Alberta has more than 9,000 irrigation pivots that could utilize this Micro-Zone Precision Irrigation technology.



ALBERTA INNOVATES CLEAN RESOURCES

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PROJECT GOALS

The overall objective of this project is to demonstrate the feasibility and economic value of a sophisticated, fully automated pivot irrigation system. This system will remotely sense soil moisture in real time and deliver a precise water prescription specific to crop and soil type. Water delivery along the pivot will be variable, based on soil moisture changes as the pivot moves around the field. The system will consist of a three-stage model - regression, hydrological data collection and machine learning - to automatically control each nozzle in real time. Reaching the best level of operation will require multiple adjustments on an ongoing basis as the model is optimized.

BENEFITS TO ALBERTA

Targeted outcomes of this technology have the potential to:

- Improve overall water conservation for Albertans, leaving more water within the overall Southern Alberta water system.
- Reduce water runoff from pivot irrigation systems.
- Result in power savings due to reduced pivot irrigation requirements.
- Encourage Alberta-made applications in other water utilization systems based on the new technologies to be developed relating to measurement diagnostics and farm-scale hydrologic modeling.
- Build knowledge capacity through the partnerships with the University of Alberta, Farming Smarter, irrigation farmers and IntelliRain.



6 Publications



10 Students
Trained



1-2 Patents



20 Project Jobs



200 Future Jobs



4 New
Products/Services

CURRENT STATUS

JUNE 2021

In the precursor project funded by Alberta Innovates, a preliminary adaptive control algorithm was developed, a preliminary 3D model on a small experimental field was created, and a model with optimal sensor information fusion was developed. For this follow-on project, Year 1 of large field testing in southern Alberta has commenced in two 160-acre field areas.