ALBERTA INNOVATES

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Performance of wireless soil nutrient sensors in conventional dryland farming in Western Canada

The use of digital technologies to increase efficiency, reduce costs and support good environmental stewardship by farmers is rapidly becoming the norm in certain parts of the world today. Unfortunately, this is not the case in Western Canada where the application of such technologies is limited, placing agriculture and the environment in this region at a disadvantage. At the same time, the adoption of such technologies in Western Canada is not as simple because agronomic conditions differ from other parts of the world where these technologies were developed and tested. To guarantee the successful use and wide adoption of such technologies in Western Canada requires independent, unbiased local testing. This project aims to test the performance and economic implications from using commercially available, wireless soil nutrient sensor technologies at the Olds College Smart Farm.

FUNDING DETAILS

RECIPIENT:

Olds College

PARTNERS:

ChrysaLabs
METOS by Pessl Instruments
PRS®
Teralytics
Prairies Economic Development Canada
Natural Sciences and Engineering Research Council
Canada Foundation for Innovation/Research Capacity Program

TOTAL BUDGET:

$61,400

AI FUNDING:

$22,500

PROJECT DATES:

February 2020 – March 2022

PROJECT TRL:

Start: 7
End: 8

APPLICATION

In-field, commercially available soil nutrient sensors and technology will be assessed for their ability to accurately measure concentrations of fertilizer nutrients, moisture, salt and acidity in the farm soil. Soil nutrient content is a critical parameter in plant growth and development, ultimately influencing crop yield and quality. The accuracy of the different sensor readings will be tested against conventional soil analysis measurements conducted in a laboratory. The overall functionality, connectivity and applicability to broad-acre dryland production will also be reviewed.

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PROJECT GOALS

- Test the performance and ability of wireless soil sensor technologies to instantly and accurately measure soil nutrient content in broad-acre, dryland farming conditions in central Alberta — and provide third-party, independent data illustrating their effectiveness and economic benefits.
- Determine how easy, efficient, timely and reliable it is to use each technology compared to soil sampling, shipping samples, and soil testing at a commercial laboratory before planting season begins.
- Evaluate the use case for collecting ongoing nutrient information as it relates to fertilizer application in a precision farming environment.

BENEFITS TO ALBERTA

- Soil nutrient content is a critical parameter in plant growth and development, ultimately influencing crop yield and quality. Selective fertilizer application based on soil needs at specific locations on a crop field is commonly referred to as 'precision farming.' Precision farming helps reduce unnecessary, wasteful, environmentally damaging, overapplication of fertilizer to cropland and reduces cropping costs for farmers.
- Not all commercially available technologies are effective and reliable in meeting farming needs. This independent evaluation on the functionality and accuracy of multiple soil nutrient sensor technologies by Olds College will be valuable to Alberta farmers who want to invest in such technologies.

1 Publication

>100 Students Trained

3 Project Jobs

4 New Products/Services

CURRENT STATUS

November 2021

Soil nutrient sensors were installed at various locations in multiple fields at the Olds College Smart Farm. Soil samples were collected throughout the growing season from appropriate depths beside each sensor and sent to a commercial laboratory for analysis and comparison. Olds College is analyzing the data from the sensors and soil sample results from previous growing seasons. User observations related to ease of installation, commissioning and functionality were recorded throughout the growing season and are being evaluated.