# Smart Agriculture Research

*2022 Collaboration: xarvio Digital Farming Solutions, powered by BASF*

*Soil Characteristics & their Effect on Disease Presence in Wheat*

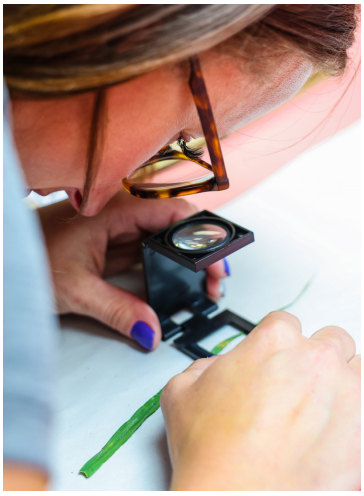
## INTRODUCTION

In 2022, four fields on the Olds College Smart Farm underwent intensive one-acre grid scouting as part of the "Advancing Agronomy through HyperLayer Data Collection and Analytics" project. This HyperLayer project integrates multiple geospatial data layers – such as soil data, yield information, imagery, etc.– and uses machine learning (ML) to establish and explain relationships between those layers.

In collaboration with xarvio Digital Farming Solutions, powered by BASF, Olds College Centre for Innovation (OCCI) completed disease identification and severity assessments in Field 15/16 on the Olds College Smart Farm to display wheat disease distribution within the field and provide a comparison of disease presence to site specific soil characteristics. The georeferenced results will be compared to geospatial soil samples within the HyperLayer project.

## OBJECTIVES

- Provide an additional layer to the HyperLayer project.
- Cross-reference the results of disease diagnostics with other geospatial data layers.



## STUDY DETAILS

- OCCI researchers completed disease identification during the 2022 growing season of:
  - Stripe rust *(Puccinia striiformis)*
  - Tan spot *(Pyrenophora tritici-repentis)*
  - Speckled leaf blotch/septoria nodorum leaf blotch *(Zymoseptoria tritici/Parastagonospora nodorum)*
- Predetermined points were assessed in Field 15/16 on the Smart Farm:
  - 325 disease severity assessments completed throughout the field.
  - 1,032 leaf samples were collected for disease identification.
- Healthy and diseased leaves were identified by OCCI, and leaves identified as diseased were sent to Agriculture and Agri-Foods Canada for plant pathologist identification.

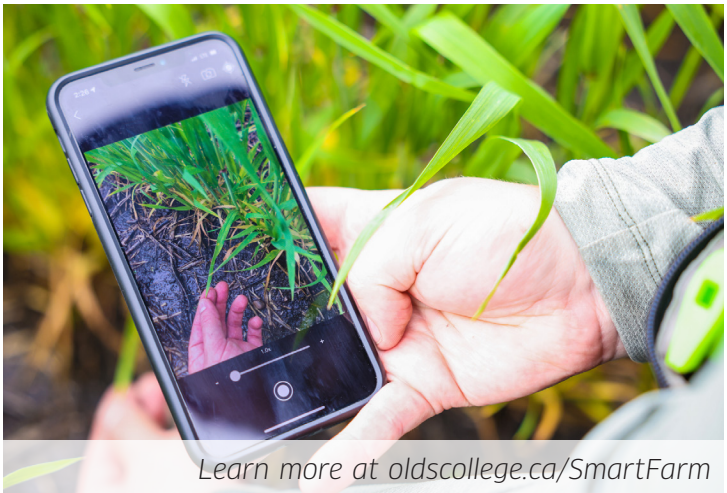
## RESULTS

Percentage of diseased leaves within each one-acre grid does not have a strong correlation with common soil sample variables or other data layers provided by the Digital Ag team at Olds College.

## FUTURE RESEARCH

The project will continue into the 2023 growing season to include:

- Validation of the disease distribution on Field 15/16 within the barley crop.
- Grid sampling of canola for sclerotinia.



*Learn more at oldscollege.ca/SmartFarm*

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