OLDS COLLEGE OF AGRICULTURE & TECHNOLOGY

SMART Farm

Smart Agriculture Research
2024 AFSC Hail Survey: High Density Scouting & Iterative Collection of Aerial Imagery for Damaged Fields

INTRODUCTION

Several research projects conducted with AFSC over the past four years have focused specifically on hail damage. During the process, it has been observed that in addition to hail, there are numerous other forms of crop damage that also exist affecting crop growth that require their own documentation.

In 2023 and now in 2024, field scouters used drone imagery to pre-select points to scout within the field, navigated to them, identified the damage type, and using AFSC adjustment protocols, they calculated the level of hail damage. From this, datasets are used to produce spatial maps in order to properly represent the variability of damage within the field. This data will allow possibility for future imagery analysis and the ability to identify other forms of crop damage. The work in 2024 enabled the collection of an additional nine fields, totaling 1,446 acres to the crop damage imagery database.

OBJECTIVES

- Create a database of collected remote sensing imagery along with respective scouting data for fields damaged by hail. Scouting records include AFSC hail adjustments and scouting documentation of each field.

STUDY DETAILS

Nine fields damaged by hail within central Alberta (totalling 1,446 acres) were assessed during the 2024 growing season.

- Drone equipment with thermal and multispectral cameras captured high resolution imagery of the field following the reported hail storm.
- Using RGB imagery captured during flights, scouters selected locations within the field to ground truth and collect a hail adjustment measurement.
- Scouters executed high density scouting within each field to collect:
    - Hail damage severity measurements.
    - Crop staging and notes.
    - In-field photos.
    - Documentation of other damage forms and anomalies identified such as lodging, drowned crop, seeding and spraying equipment errors, and wildlife damage.

RESULTS

As the 2024 imagery and data collection was consistent with the work conducted in 2023, the database now contains 15 fields totaling 2,414 acres. Together the datasets enable validation and testing of emerging technologies attempting to digitize and classify forms of field damage using imagery.

FUTURE RESEARCH

In addition to other research, AFSC and OCCI are continuing to collect additional datasets to add to this database from damaged crops in the 2025 growing season.

Learn more at oldscollege.ca/SmartFarm