Smart Agriculture Research
2023 AFSC Hail Survey: High Density Scouting & Collection of Aerial Imagery for Hail Damaged Fields

INTRODUCTION

Previous hail-related projects completed with Agriculture Financial Services Corporation (AFSC) in 2021 and 2022 identified that aerial imagery can better inform AFSC adjusters on where to complete assessments within a field.

In 2022, different types of crop damage within a field were difficult to categorize and delineate due to limited scouting records; therefore, it was suggested to document details regarding the type and level of damage within the field with a specific focus on hail. Deliverables from this work can be used to increase the confidence for future imagery analysis and classifications.

OBJECTIVES

- Create a database for baseline imagery of hail damaged crops to be used in the future development of software training and modeling, which includes respective AFSC adjustments and scouting documentation for each field.

STUDY DETAILS

Six fields damaged by hail within central Alberta (totaling 968 acres) were assessed during the 2023 growing season.

- Drone equipment with thermal and multispectral cameras were flown to capture high resolution imagery of the field 10 to 14 days following the hail storm.

- Using RGB drone imagery, scouters selected locations within the field for measurements which enabled them to identify – and then ground truth – areas of damage such as lodging, drowning, damage from equipment issues, or possibly hail.

- Scouters completed high density scouting within each field to collect:
  - Hail severity measurements using AFSC protocols.
  - Crop staging and notes.
  - In-field photos.
  - Documentation of other damage forms and anomalies identified.

- Available satellite imagery of the field captured before and after the storm were recorded.
  - NDVI change detection layers were built using pre and post storm imagery.

RESULTS

A geospatial database was built and provided to AFSC with the imagery and datasets collected in 2023 which include:

- Drone imagery: RBG/Multispectral/Thermal
- Satellite imagery: NDVI, RGB, NDVI change detection layers
- Using the high density scouting information collected, a geospatial layer was developed to visualize the variability of hail damage observed within the field.

FUTURE RESEARCH

AFSC and OCCI are currently defining possible projects to conduct during the 2024 growing season using learnings from the previous years of research.

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