

Decision Ag with Remote Sensing



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

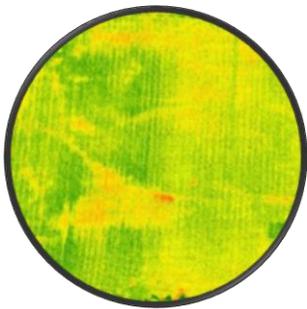
Overview

Remote sensing in agriculture continues to grow and serve as a data layer for agronomists and growers to evaluate soil and crop variability. A majority of these images become "pretty" pictures with limited value to the grower. This project is proposed to evaluate remote sensing from a variety of platforms, image resolution, and acquisition times during the growing with primary emphasis on determining methods to improve in-season nitrogen management and "Big Data" management. The project will be conducted with collaborating growers from west-central and northwest Ohio and northeast Indiana. Participating growers will preferably work with their agronomist or be paired with an agronomist. Farmers will then receive imagery from remote sensing vendors throughout the growing season. Concurrently, the Ohio State University will be conducting a nitrogen study at the Farm Science Review (FSR) that will also include extensive soil and tissue N sampling to serve as ground truth data. At the FSR site, commercially available UAVs platforms will be deployed weekly to collect high resolution visible, thermal, multi-spectral and NIR imagery.

A series of three in-person meetings and monthly videoconferences are planned that bring all participants together to discuss imagery collected to-date, crop status and decision ag management strategies. These sessions will serve for growers, agronomists, vendors, and researchers to share results to-date and ideas around how imagery could be used in making in-season decisions.

The goal of this project is to understand and establish how multiple sources of imagery can be combined and efficiently presented to growers and their agronomists to help with in-season crop decisions with a focus on nitrogen. Fundamental questions:

1. Spectral Resolution – What Wavelengths?
2. Spatial Resolution – How close?
3. Temporal Resolution – How often?
4. Storage and access -- How an Ag Data Cooperative (ADC) can efficiently provide access to large data sets.



Imagery Vendors and Type

Participating growers will receive imagery from the following five companies acquired through a number of flights during the growing season.

- Climate Pro – Satellite Imagery (5-m resolution); 5-8 images
- ARC – Hyperspectral (1-m resolution); 6-10 flights
- AirScout – RGB & Thermal (1-m resolution); 8-10 flights
- GeoVantage – multi-spectral including NDVI (0.5-m resolution); 2 flights
- Cruce Aviation – High Resolution Imagery (1 inch resolution); 2 flights

The total value for this imagery is estimated at \$39 per acre. Vendors will deliver images directly to the grower. Growers can then work with their agronomists, dealers, or other decision makers.

Additional Activities

- 3 in-person meetings
 - 1st Meeting – June 3rd (Visiting agronomist Ken or Isaac Ferrie)
 - 2nd Meeting – Early August
 - 3rd Meeting – Early December (Final project results presented)

Grower Requirements

- **\$10 per acre** cost with a minimum 250 acres (at least 50% corn acres)
- Provide field boundaries (shapefile preferred) for those acres enrolled
- Participation in 3 meetings (June 3, early August, early December) plus monthly online videoconferences
- Ohio State will request access to imagery to archive and work on delivery solutions for the Ag Data Coop
- Complete end-of-season survey for the project
- Complete a non-disclosure agreement (NDA) with Ohio State

Non-disclosure agreement (NDA) – since this project involves a variety of partnerships including remote sensing companies, growers, agronomists, university and other private companies, all growers and agronomists will be asked to sign a 10-month NDA. An NDA serves as a legal document to ensure an agreement exists and the interests of all parties involved are willing to speak openly during project meetings about what is being researched and discussed but does not allow public comment.

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***Current planned flights for project are based off of having 40 growers. Plans may change slightly if number of grower participates are less than 40.**