The Impact of Drone Crop Monitoring on the Efficiency of Research Farms

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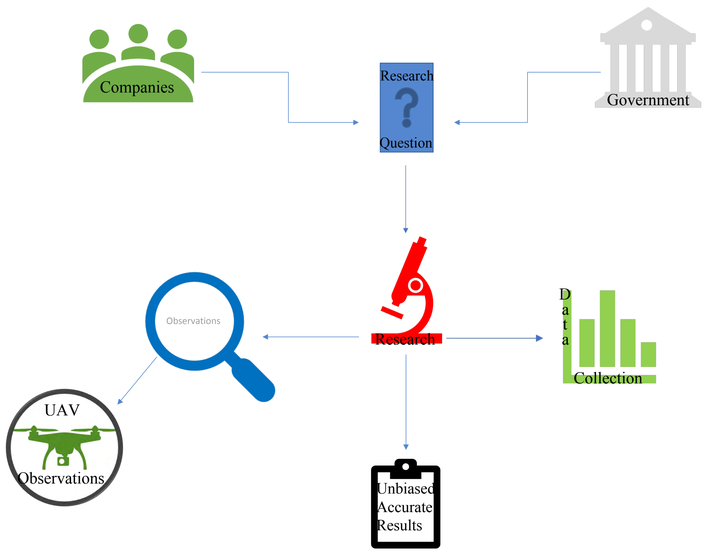
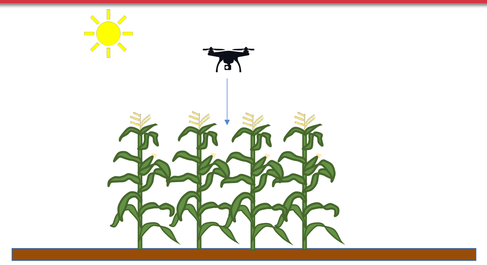
Independent Research Cycle



Objectives

1. **Determine the efficacy of the use of drone technology in a research agriculture setting.**
2. **Determine the efficiency of plant health monitoring via drones.**

Background



The drone flies over crops at 330 feet and captures pictures according to the flight path.

Methods

Results

RGB stitched image.

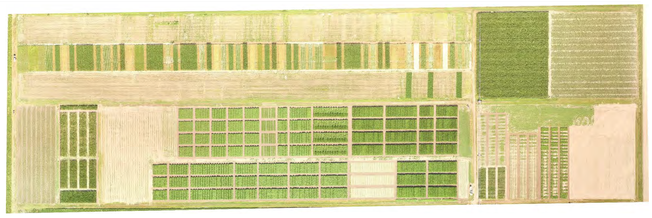


Figure 1 – The RGB stitched image displays the field in visible light.

NDVI stitched imagery displays visible differences in crop health.

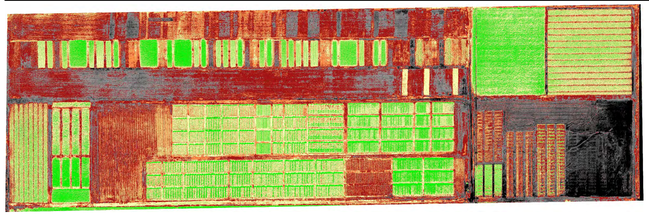


Figure 2 – The NDVI field health report is generated from many images taken in NIR (Near Infrared) that are subsequently processed through an algorithm.

The cost per acre of field observations.

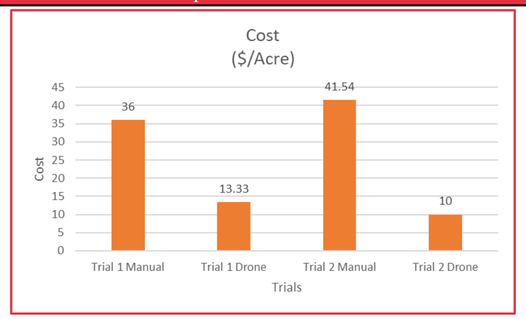


Figure 3 – Manual crop observations versus drone crop observations. The drone crop observations proved to be more cost effective in both trials.

The accuracy of plant health observations.

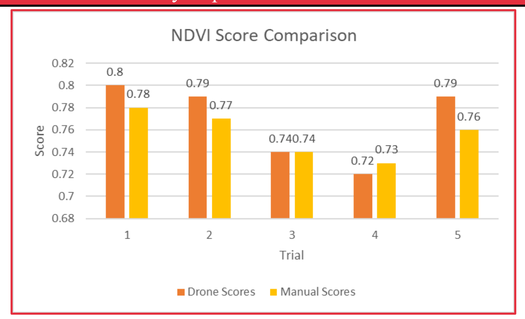


Figure 4 - An NDVI score accuracy comparison between manual scoring and drone-based scoring which shows very similar results.

Conclusions

Drones can greatly reduce the time it takes to conduct plant health observations while providing results that are very accurate.

Future Work

1. **Repeat the study on a large scale commercial farm to determine the efficacy of agricultural drone technology in its current stages.**
2. **Analyze the accuracy of the data collected via drone compared to data collected by ground truthing to find an optimal rate of drone use.**

This program was supported by Grant Program no. 2017-67032-26018 from the USDA National Institute of Food and Agriculture.