



Drone-Assisted Field Mapping

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PROJECT OVERVIEW

The purpose of this project was to prevent significant financial losses from poor performing crops through the use of an early detection system.

The objectives of the project included:

- Flight time between 5 and 15 minutes
- Fly at least 50 feet above ground
- Fly along designated waypoints
- Be cost effective for Farmers
- Identify crop health problems in field
- Use off the shelf components when available
- Budget of no more than \$2500



Scan to watch a video of the drone in action.

HARDWARE



The 3DR RTF X8 drone platform chosen for this project has a 2.2lb payload. The X8 drone is capable of a flight time around 10 minutes at full payload and can be operated autonomously or by a pilot with a transmitter. The X8 drone is equipped with several sensors including GPS, a magnetometer and a first person view camera capable of streaming live real-time video.

A Canon SX260 HS with a modified lens filter was chosen as the vision system for this project. The camera is remotely triggered by the flight controller on the drone based on GPS waypoints via USB.



A photograph of Yolo Athletic Fields taken with a GoPro under normal exposure settings at an altitude of 200 feet.



A photograph of Yolo Athletic Fields taken with the Canon SX260 HS at an altitude of 400 feet. This is raw image data before post processing takes place.

SOFTWARE



Mission Planner software was used to map out autonomous flight missions using waypoint navigation. The drone was capable of flying to the waypoints sequentially with a high degree of accuracy.



An NDVI (Normalized Differential Vegetation Index) processed photograph with colors representing the health of the field based on the levels of chlorophyll.