Agriculture Application using Unmanned Aerial Vehicles (UAVs)

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Unmanned Aerial Vehicle (UAV):

UAV is the acronym for Unmanned Aerial Vehicle, which is an aircraft with no pilot on board. UAVs can be remote controlled aircraft flown by a pilot on the ground using a control station or can fly autonomously based on pre-programmed flight plans or more complex dynamic automation systems. UAVs are currently used for a number of missions, including reconnaissance and attack roles.

FLIGHT SPEC	ENDURO DRONE
Size (Rotor center-to-center)	28 in (71 cm)
Weight	6 lbs (2.72 Kg)
Cruising Speed	30 mph (48 km/hr)
Linear Flight Distance	13 Miles (21 km)
Flight Endurance	25 min
Maximum Wind Tolerance	25mph (40 km/hr)
Acres Covered/Flight	160 acres (65 ha)
Telemetry Range	1mile (1.6 km)
Batteries	4 Sets (8 Batteries)

3. Mid-Field Weed Identification:

Mission: Using Normalized Difference Vegetative Index (NDVI) sensor data and post-flight image processing to create a weed map for the growers and their agronomists.

NOTE: It's easier to differentiate areas of high-intensity weed proliferation from the healthy crops growing right alongside them. In the past, many growers don't realize how pronounced their weed problem was until harvest time.

Enduro Drone System

4. Variable-Rate Fertility:

Mission: By using drone-generated, variable-rate application (VRA) maps to determine the strength of nutrient uptake within a single field.

NOTE: Farmers all over can apply 60 pounds of fertilizer to the struggling areas, 50 pounds to the medium areas, and 40 pounds to the healthy areas, decreasing fertilizer costs and boosting yields.

Computer Systems

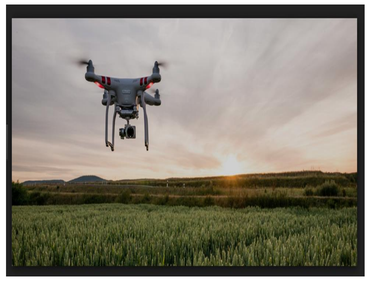
5 Actual Uses For Drones In Precision Agriculture Today:

From the ability to image, recreate, and analyze individual leaves on a soybean plant from 400 feet, to getting information on the water-holding capacity of soil, to variable-rate water applications out West, the industry has been sold on how UAVs can deliver signals for both growers and crop consultants alike.

1. Mid-Season Crop Health Monitoring (aka Scouting):

Mission: Inspect in process crops from above with Normalized Difference Vegetative Index (NDVI) and near-infrared (NIR) sensors

NOTE: The task was originally done by a college intern walking fields with notepad in hand, but with the farmers having access to drone it allow for coverage of more acres, as well as the capturing of data that cannot be seen by the human eye. It removes much of the human error aspect of traditional scouting.



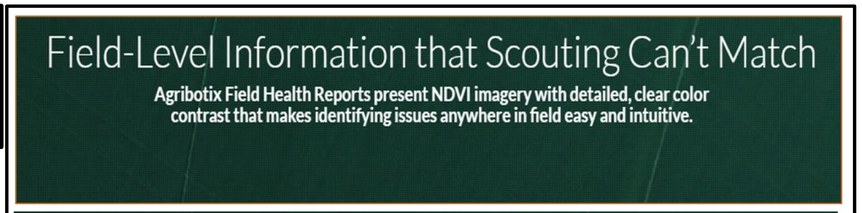
Agrion Drone System

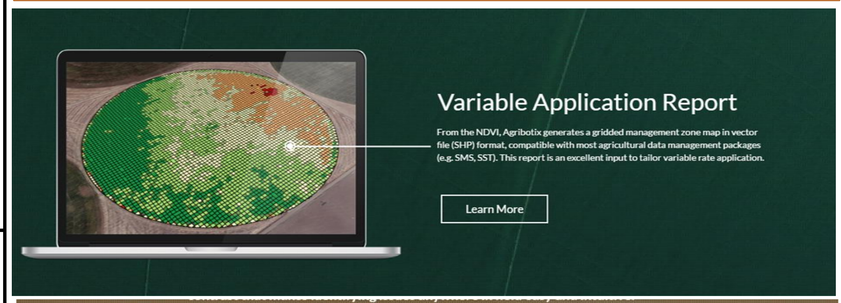
5. Cattle Herd Monitoring:

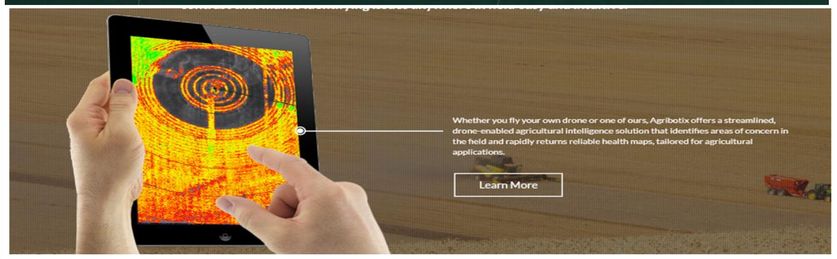
Mission: Using drones for monitoring herds from overhead, tracking the quantity and activity level of animals on one's property.

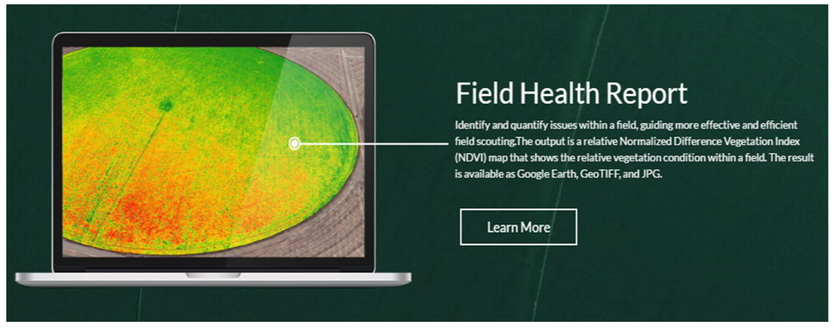
NOTE: Drones are most helpful for night-time monitoring due to the human eye's inability thus far to evolve to the point of seeing in the dark.

FLIGHT SPEC	HORNET DRONE
Size (wing tip to wing tip)	6'4"
Weight	6 lbs
Cruising Speed	33 mph (48 km/hr)
Linear Flight Distance	40 Miles
Flight Endurance 25 min	80 min
Maximum Wind Tolerance 20 mph	20mph
Acres Covered/Flight 400 acres	400 acres
Telemetry Range	1mile (1.6 km)
Batteries	2 per flight





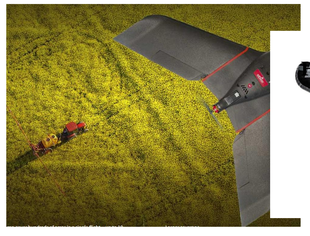




2. Irrigation Equipment Monitoring:

Mission: Manage multiple irrigation pivots.

NOTE: It is a pain for farmers, who have many fields spread out across a county or region. Once crops like corn begin reaching certain heights, mid-season inspections of the nozzles and sprinklers on irrigation equipment that deliver much-needed water becomes a challenge for the growers.



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