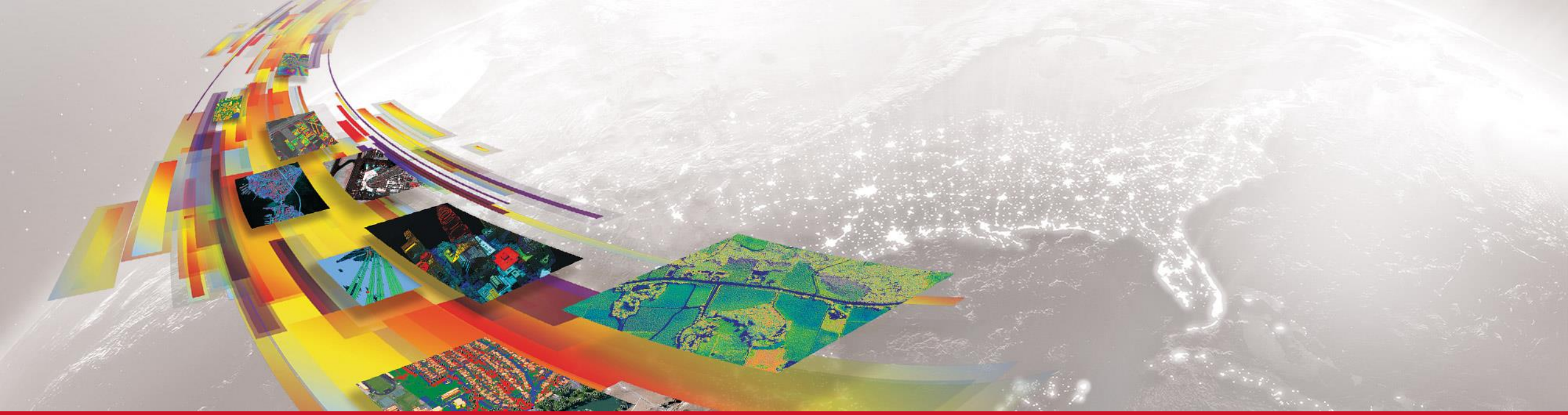


PARTNER WEBINAR SERIES

USING MULTISPECTRAL IMAGING TO BOOST CROP HEALTH: FROM DATA COLLECTION TO ANALYSIS

AUSTIN COATES | NIGEL BROWN | DREW BAUSTIAN

HARRIS® | MicaSense®

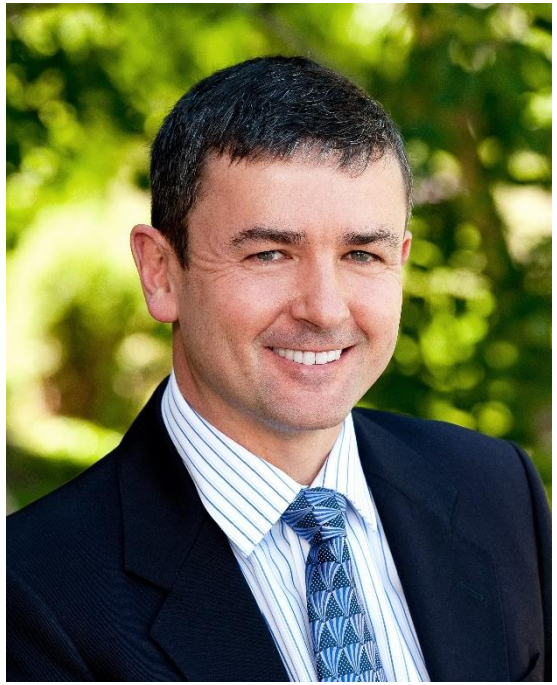
Presenters

Austin Coates

Product Manager ENVI Crop Science

Harris Geospatial Solutions Inc.

austin.coates@harris.com



Nigel Brown

Partners Manager

Harris Geospatial Solutions Inc.

nigel.brown@harris.com

Drew Baustian

Business Development Manager

MicaSense, Inc.

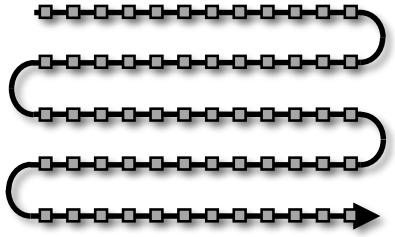
drew@micasense.com

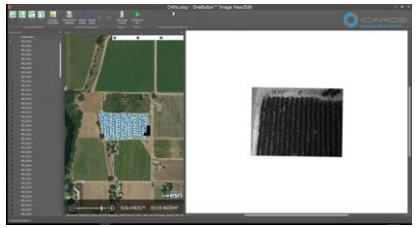
Poll Question #1

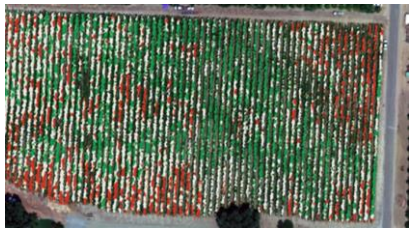
What best describes your role?

A. I am a grower
B. I am an educator/researcher
C. I am a service provider
D. I am an integrator
E. Other

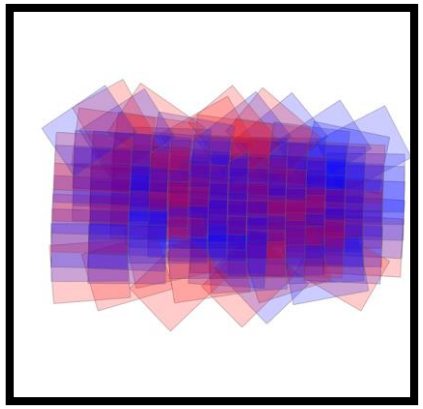
From Data Collect to Information Discovery

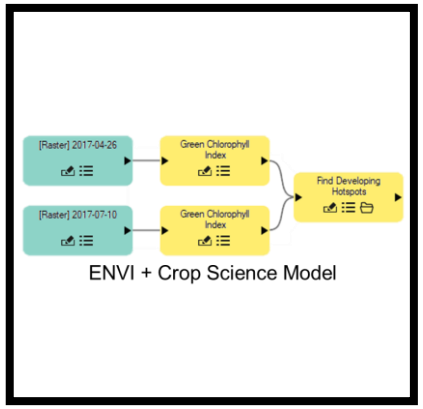


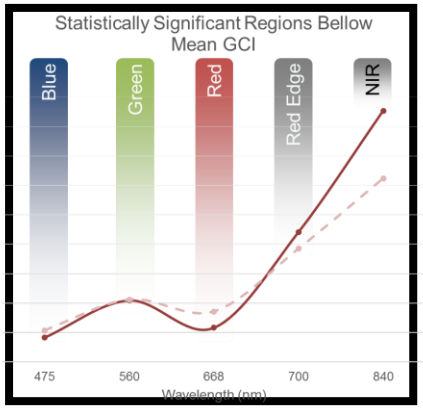




COLLECT | INGEST | MOSAIC | ANALYSE | DISCOVER







RedEdge-M: The sensor that doesn't compromise

Five band multispectral sensor that...

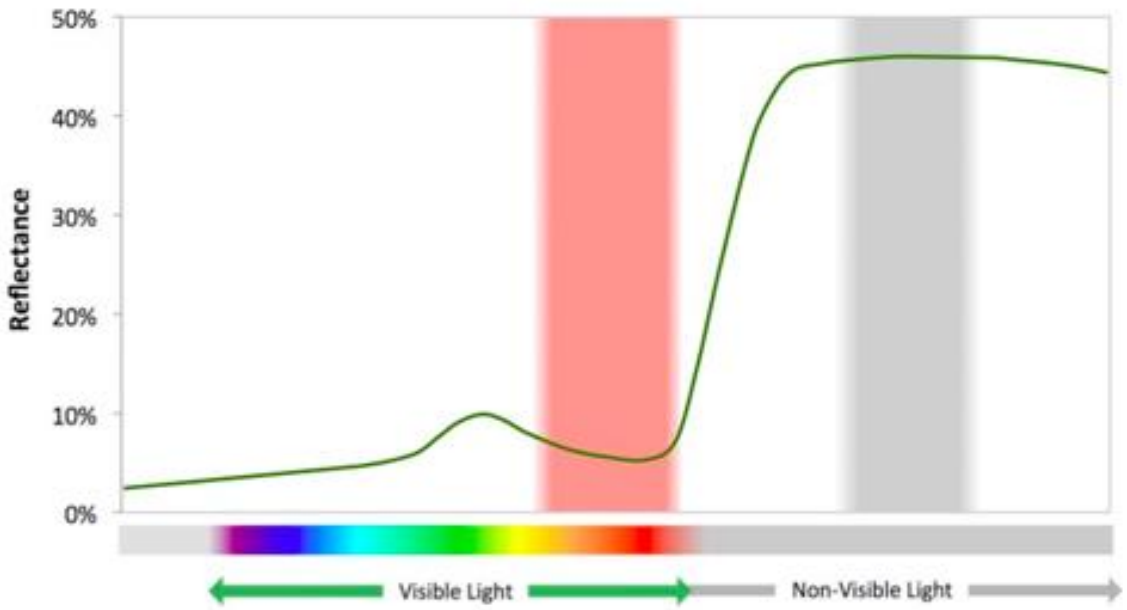
- Integrates with almost any drone
- Generates vegetation index layers and composites (including RGB) in one flight
- Gives full access to raw data (metadata—transparency)
- Produces data that can be processed in many platforms
- Radiometric calibration for analysis over time
- Is rugged and reliable

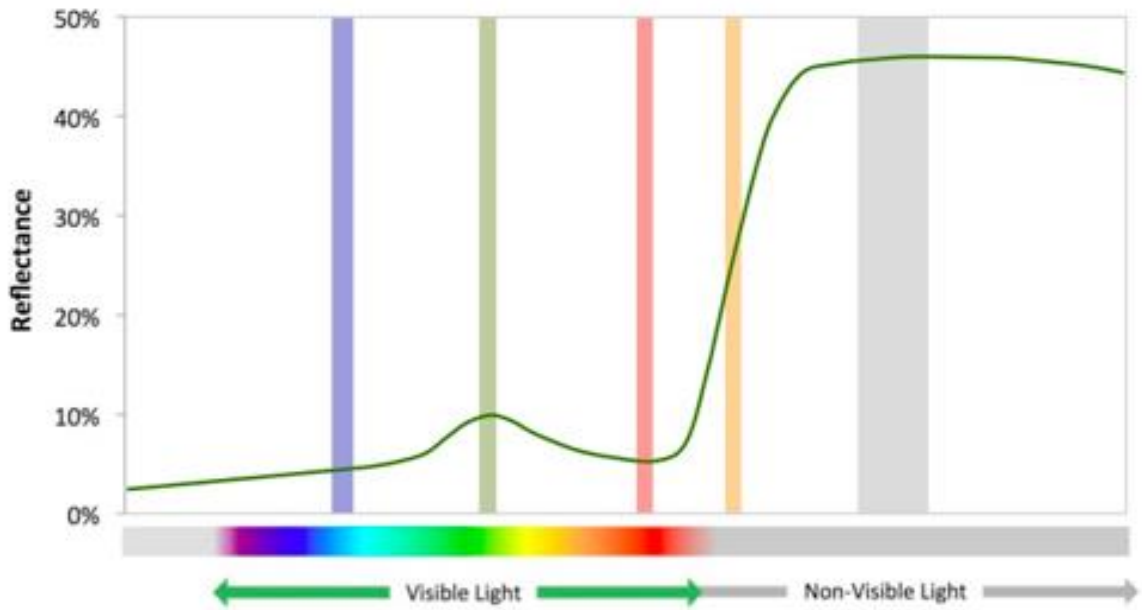
It’s easy to use

- **Embedded mounting points** for quick integration, or available integration kits
- **WiFi interface** makes setup simple
- Captures images on **timer or overlap mode**
- Power provided via battery pack or drone
- **SD card** for easy image transfer

It produces valuable information

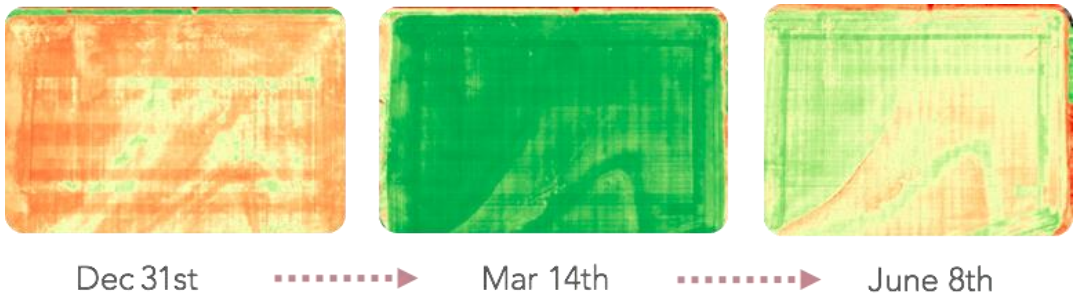
- **Narrow bands** for precise measurements; no data averaging or band contamination





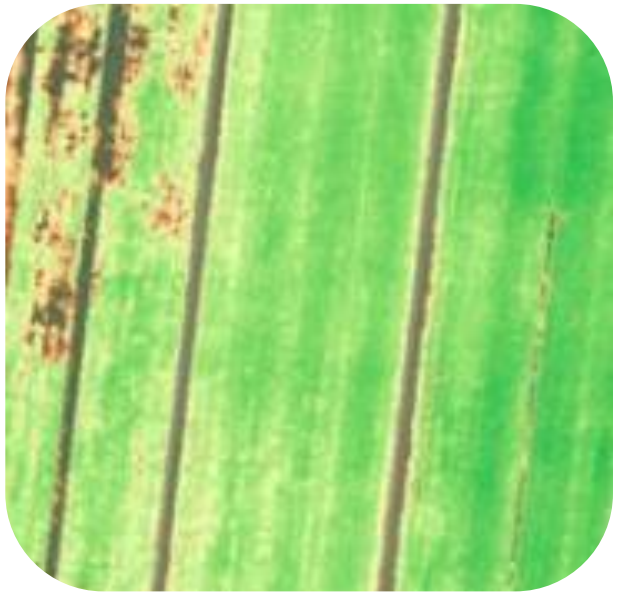
Radiometric Calibration

- Important to know input light in all five spectral bands.
- Reflectance panel 'anchors' the captured data that is independent of the lighting conditions of the flight.
- Enables time analysis, use of agronomic models

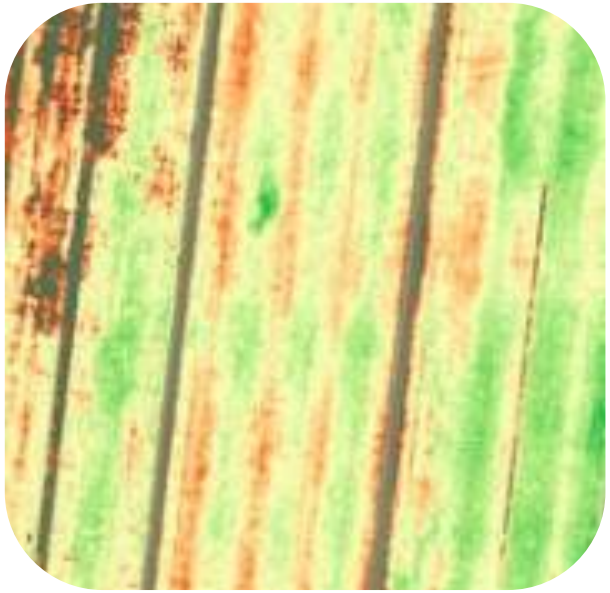


Red edge waveband

- See stress, disease that doesn’t show in other bands
- Detect stress, disease earlier
- Manage problems more effectively



NDVI (no red edge waveband)



NDRE (with red edge waveband)

Poll Question #2

What is your experience level with agricultural drone imaging?

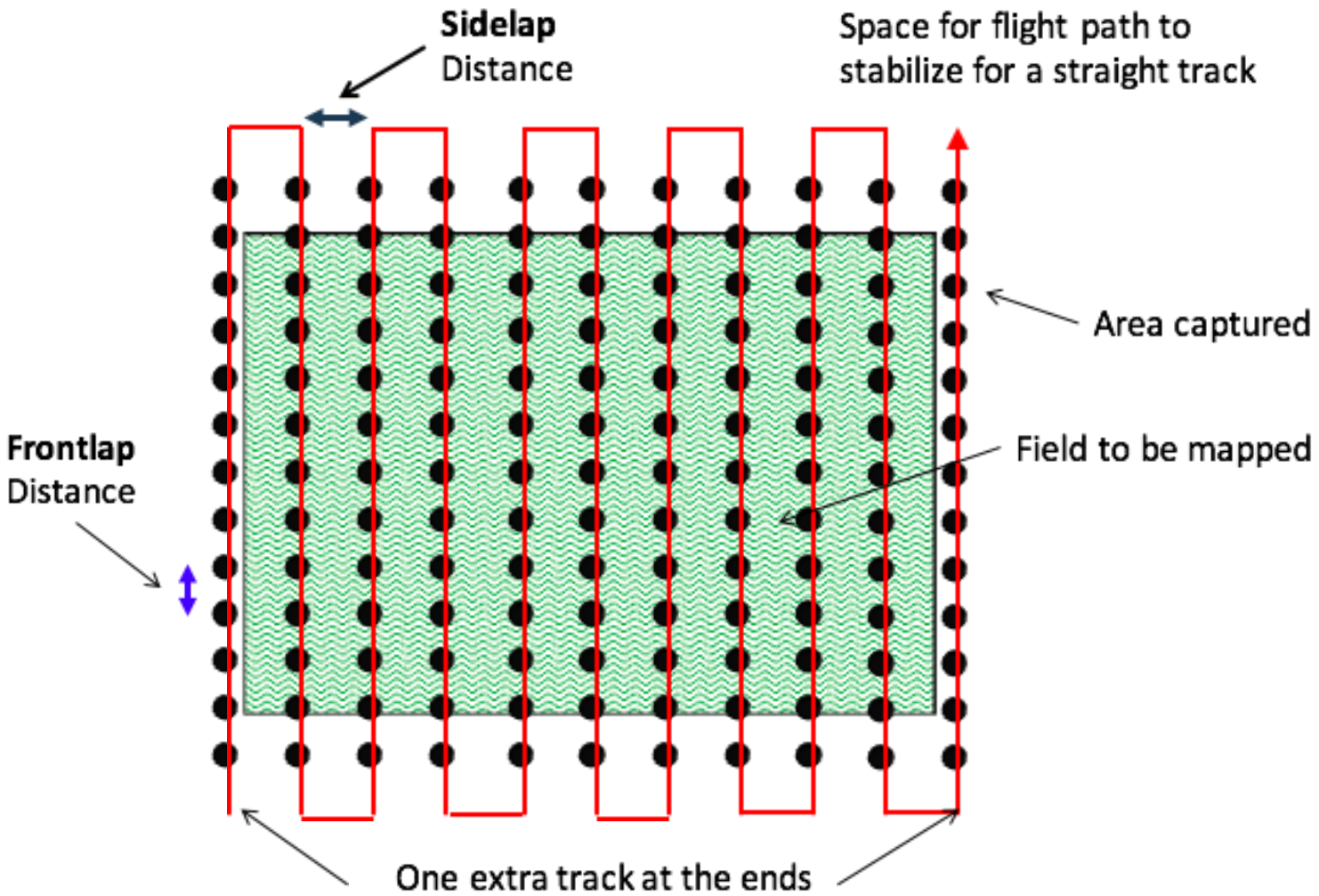
A. Very little; I don’t have a drone yet.
B. Some, but still learning; I have a drone and fly with the stock camera.
C. Quite comfortable; I fly frequently and am exploring different payloads.
D. I’m an expert; I fly with different drones and many different payloads.

Data-Collection—things to consider

Lighting Conditions: Clouds

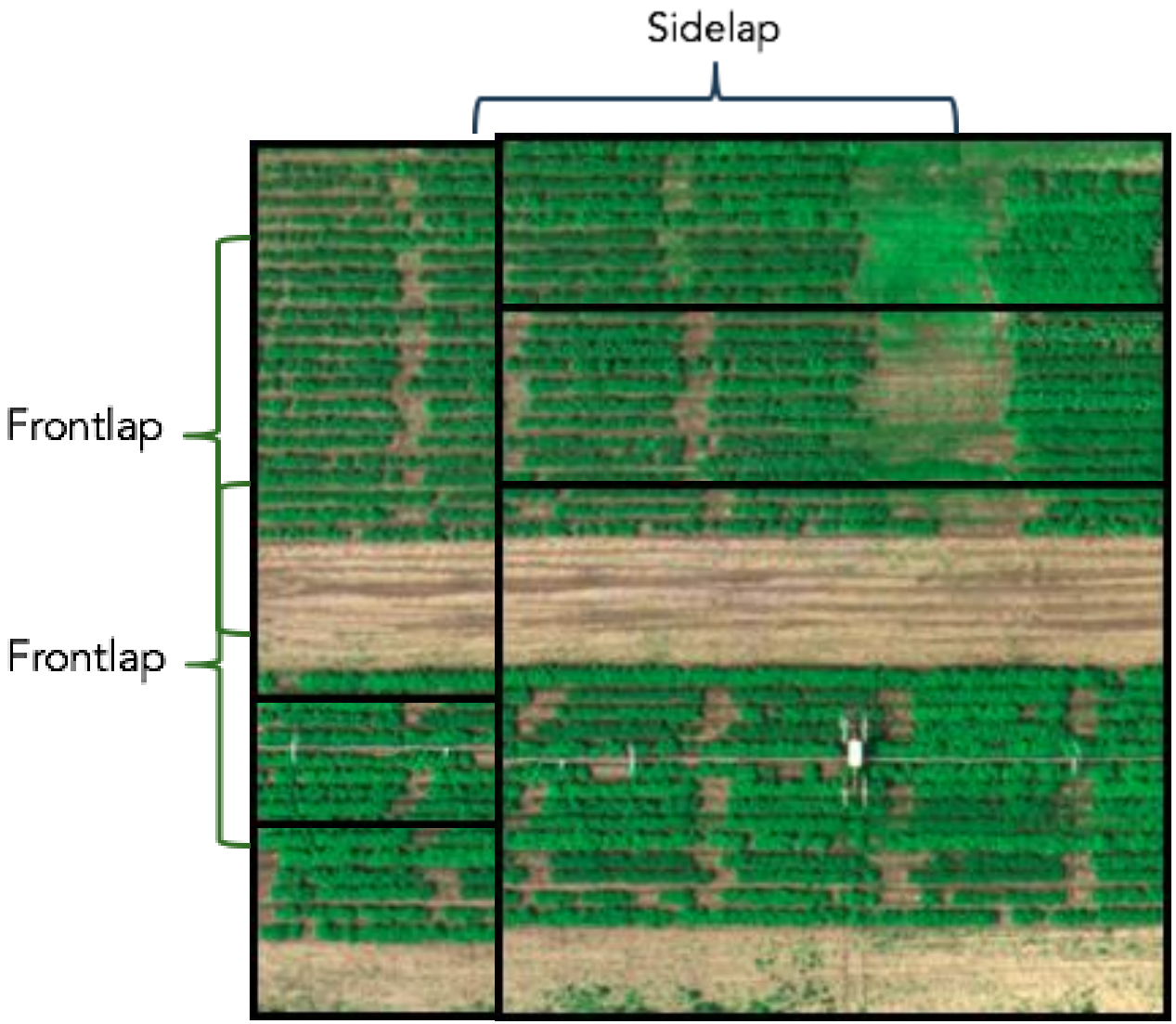
- Consistent lighting conditions are ideal
- Avoid changing light conditions DURING a flight
- Avoid “popcorn” clouds

Defining a mission



Overlap

Maintain consistent 70% overlap for best results



Poll Question #3

What problems are you most frequently using imagery for?

A. Identifying crop stress
B. Counting individual plants or trees
C. Yield estimates
D. Identifying and monitoring disease
E. All of the above

Workflow

PrecisionPass – Field Validation

ENVI – Image registration

ENVI OneButton – Orthomosaic

ENVI Crop Science – Analysis

PrecisionPass

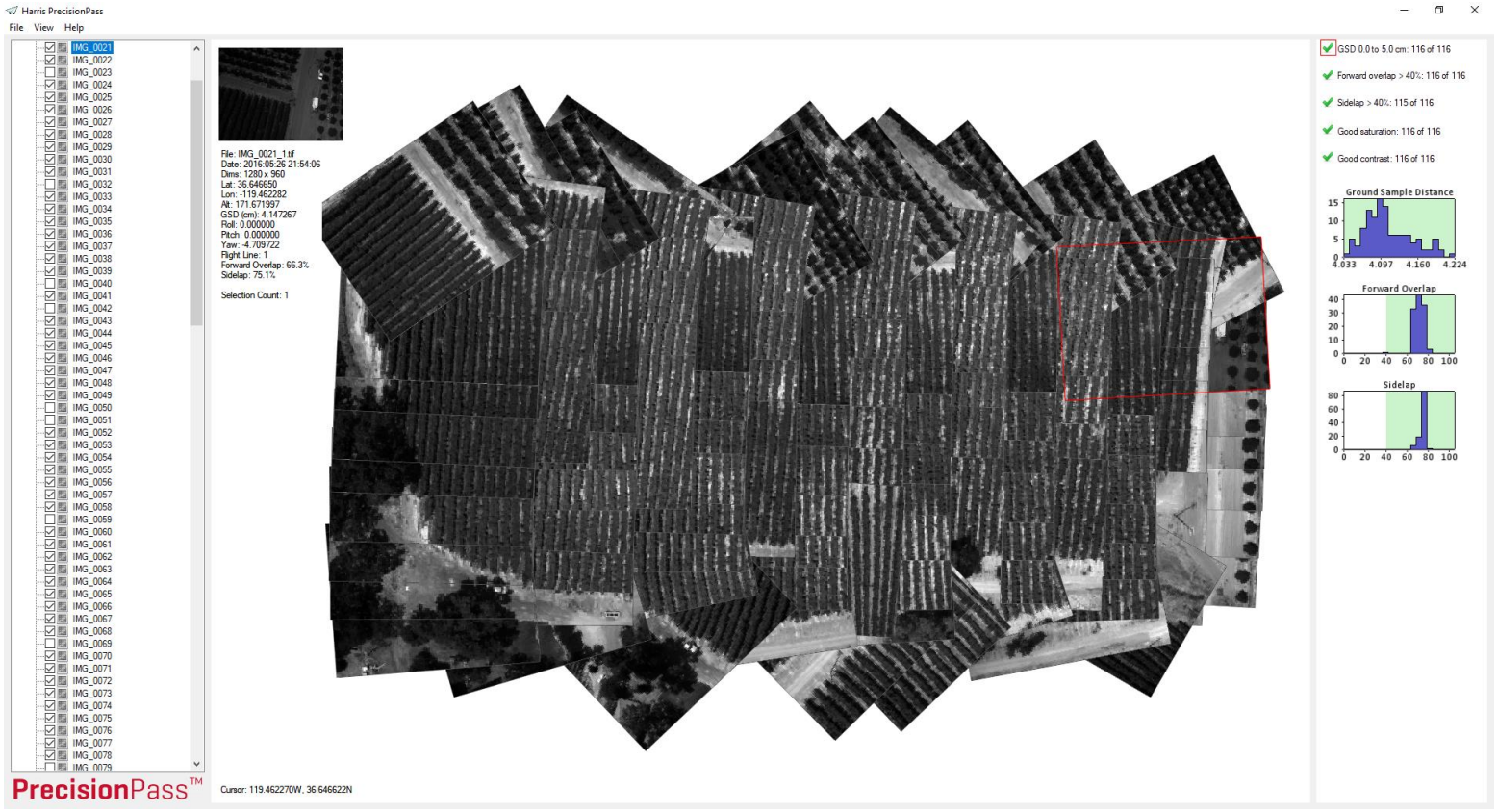
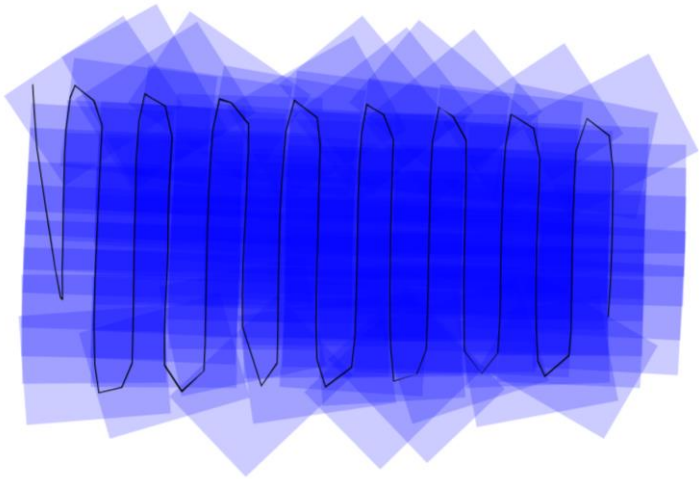
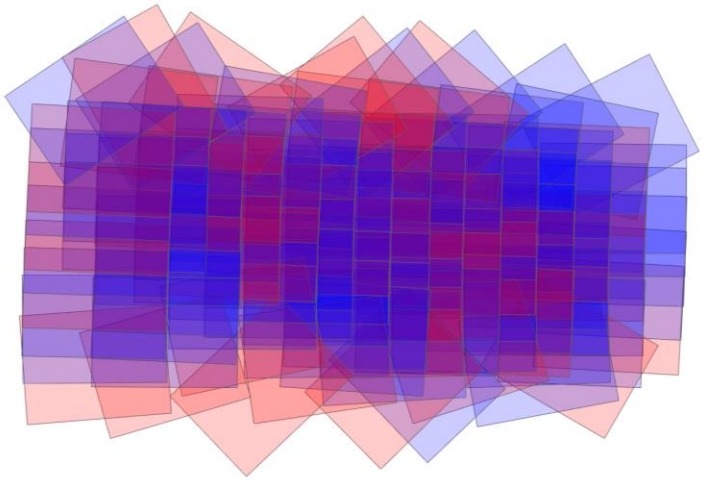


Image Overlay Turned On



Flight line displayed over 5cm GSD check



Where there is and is not 70% overlap

ENVI UAV Toolkit

Blue

Green

NIR

Red Edge

Red

https://github.com/envi-idl/UAVToolkit

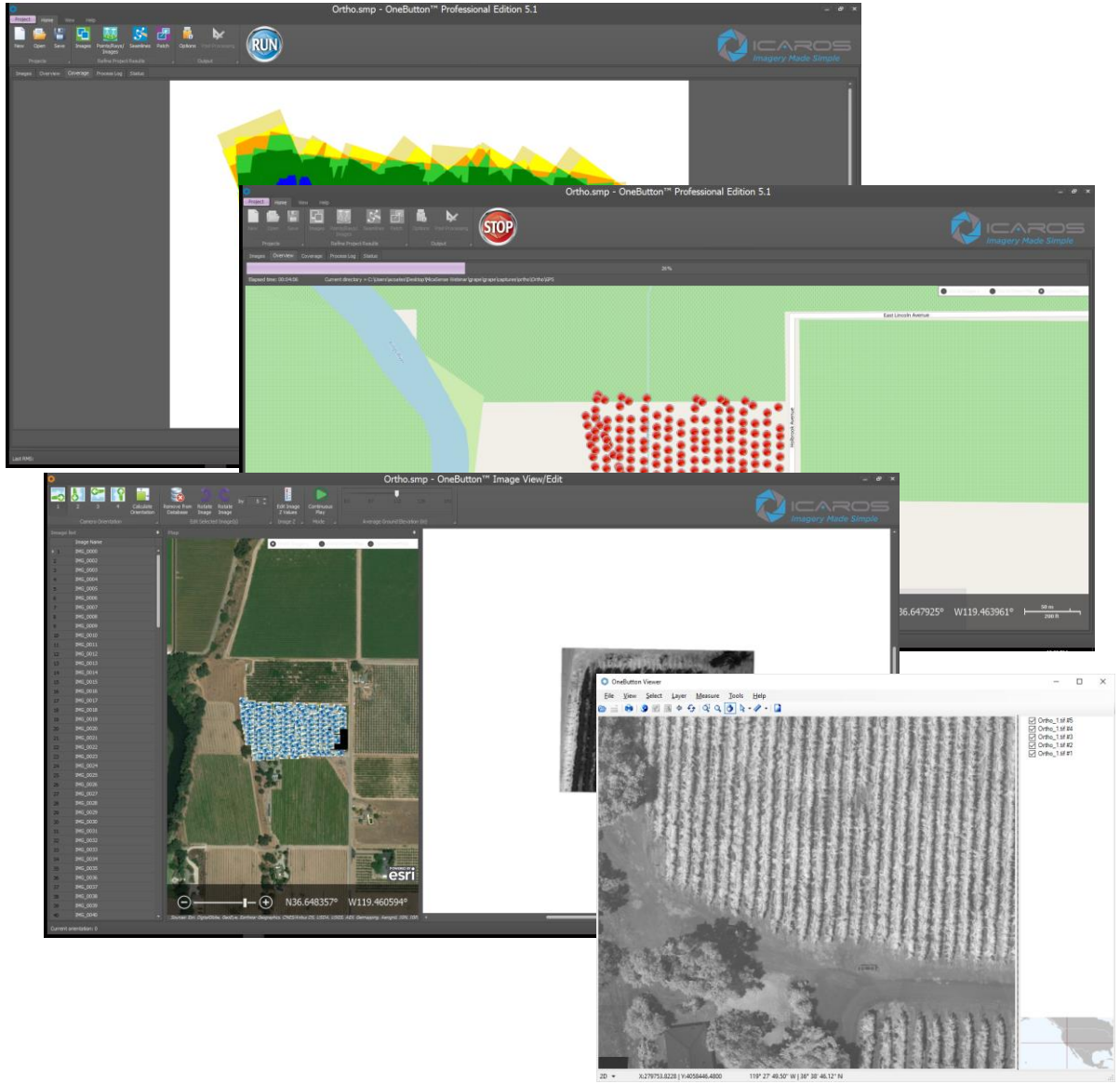
ENVI OneButton

ENVI OneButton™

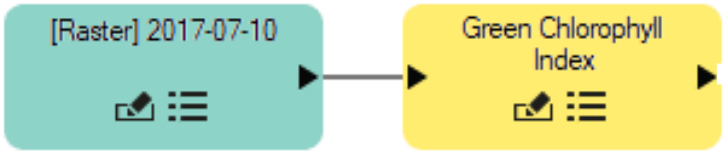
- Easily orthorectify and georeference aerial and UAV data
- Requires no training in photogrammetry
- Integrated with ENVI

ENVI OneButton™ Professional

- Includes all OneButton Automation
- Fine tune image matching
- Complete control over the photogrammetric process
- Advanced editing & QA modes
- Integrated with ENVI

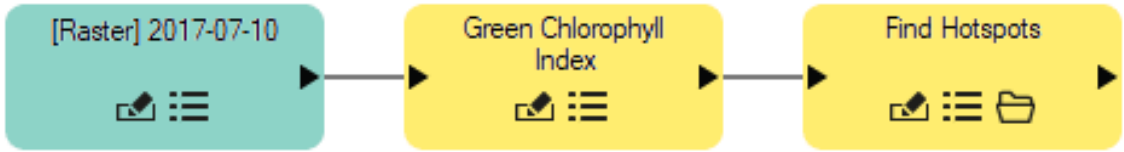


ENVI (Vegetation Index)



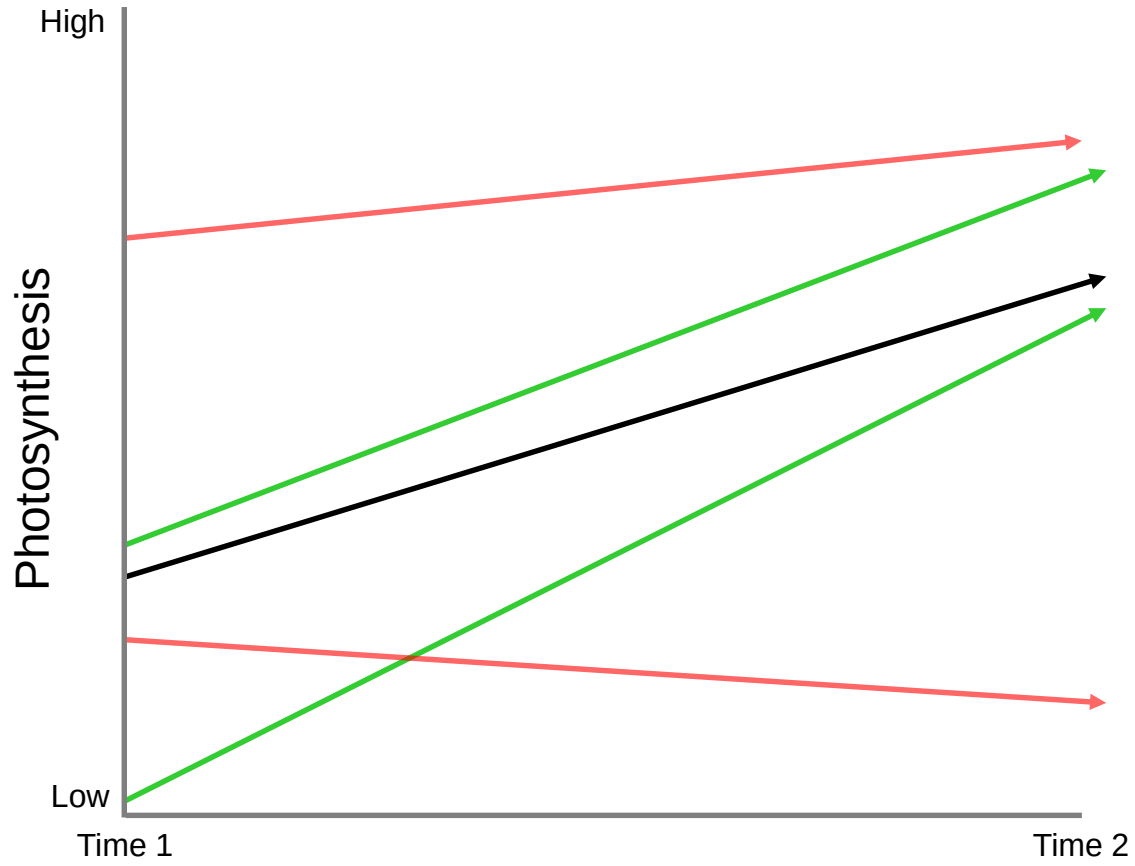
ENVI + Crop Science Model

ENVI + Crop Science (Hotspots)

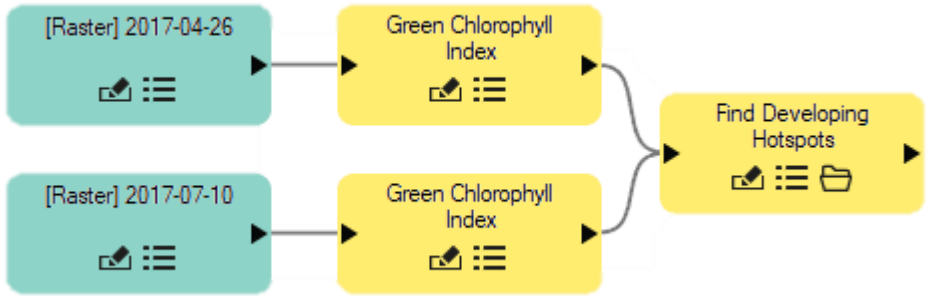


ENVI + Crop Science Model

Developing Hotspots Explained

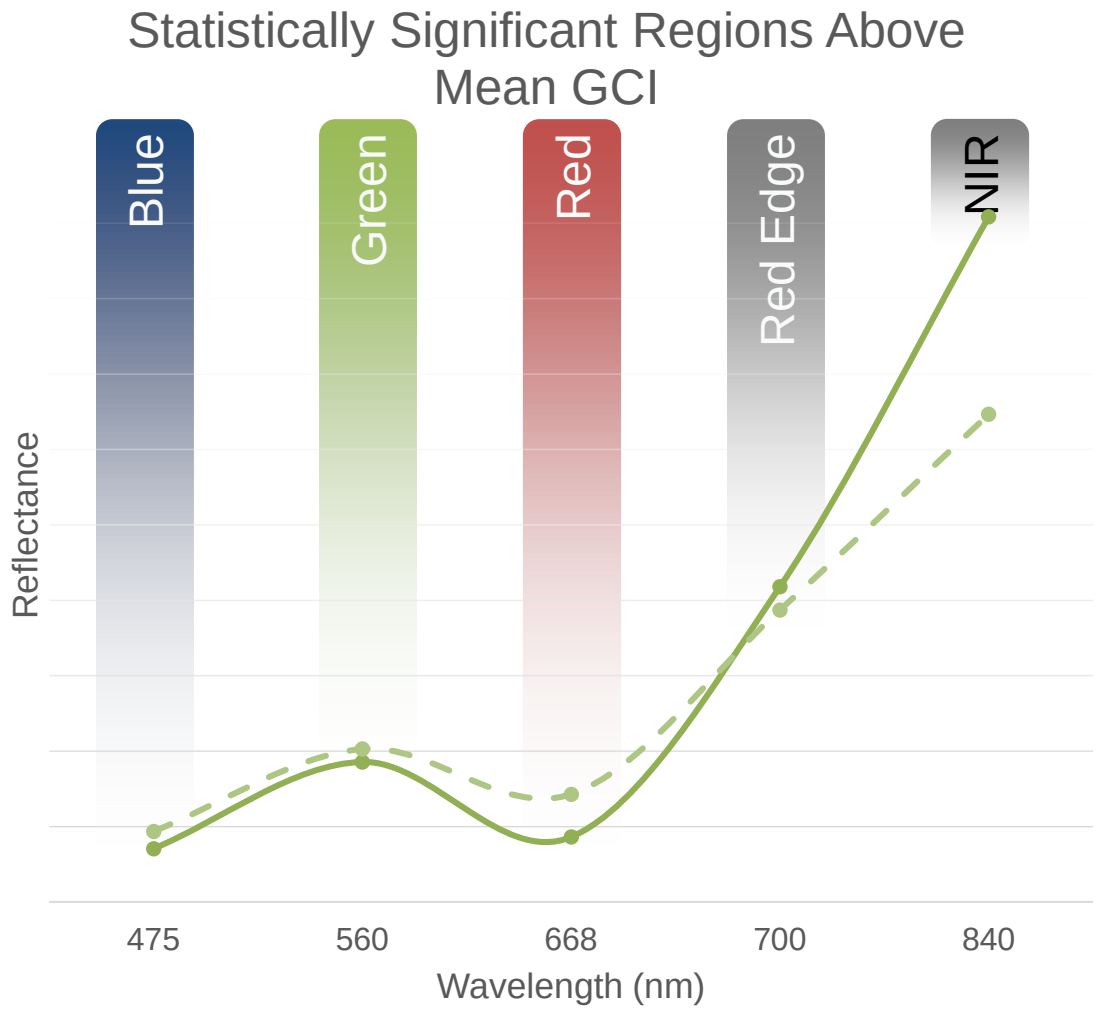


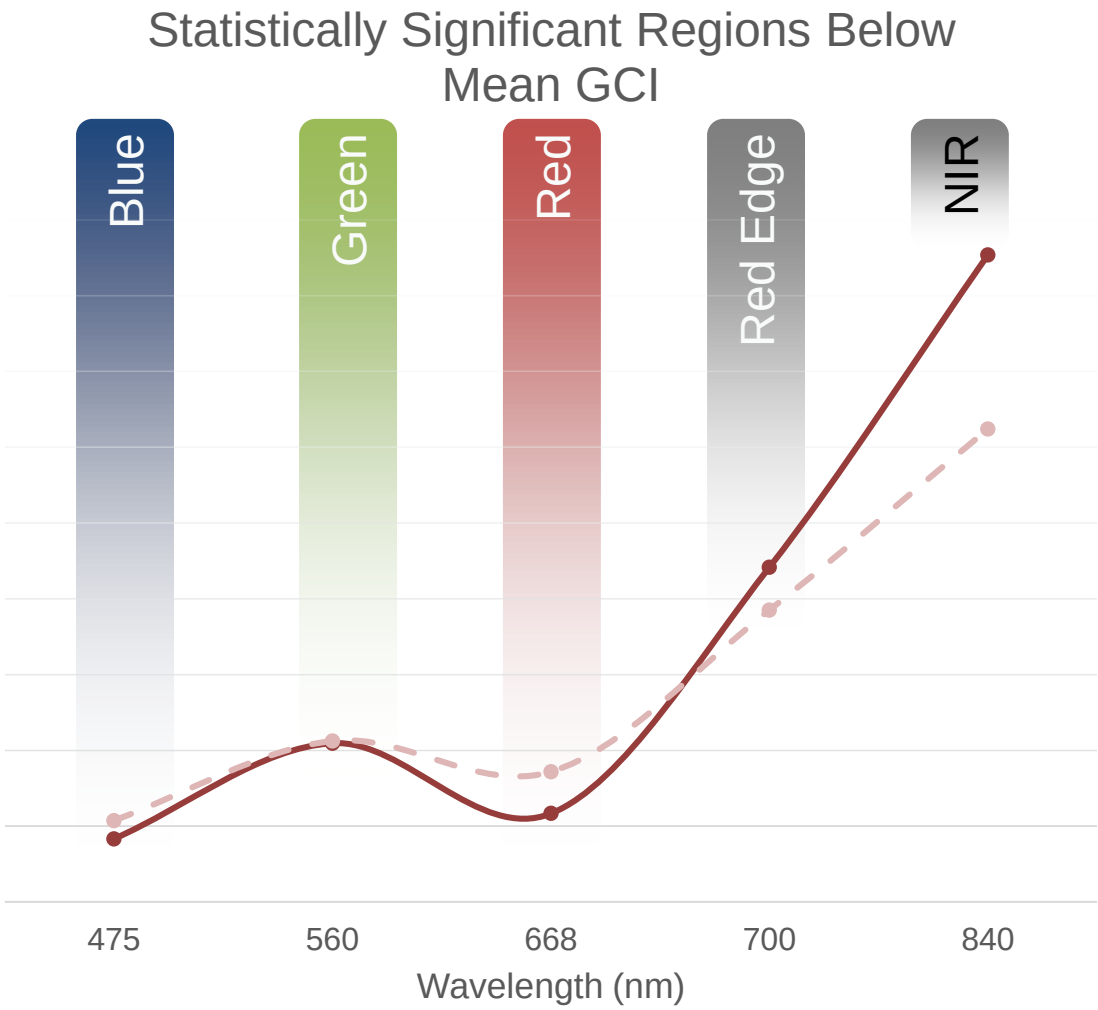
ENVI + Crop Science (Developing Hotspots)



ENVI + Crop Science Model

Spectral Shift





4/26/17 - - - - - 7/10/17 ——————

Visual Manifestation

Healthy (left) and stressed (right) vines, as seen from in-field inspection

Poll Question #4

What peaked your interest most during this webinar?

A. MicaSense RedEdge Sensor
B. PrecisionPass
C. The UAV Toolkit
D. ENVI OneButton
E. ENVI CropScience

QUESTIONS?

For more information on the MicaSense RedEdge Sensor:

www.micasense.com/ or contact drew@micasense.com

For more information on Harris Geospatial Solutions analysis tools

www.harrisgeospatial.com or contact geospatialinfo@harris.com