Valuable New Information for Precision Agriculture

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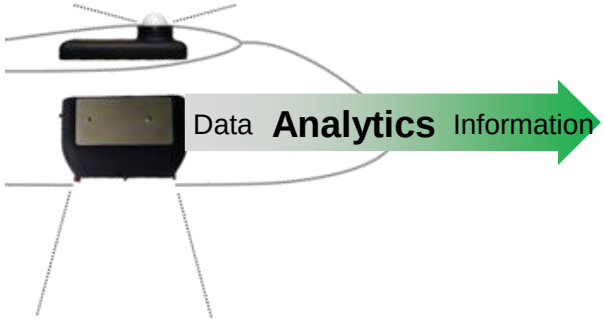
Founder & CEO - SLANTRANGE, Inc.

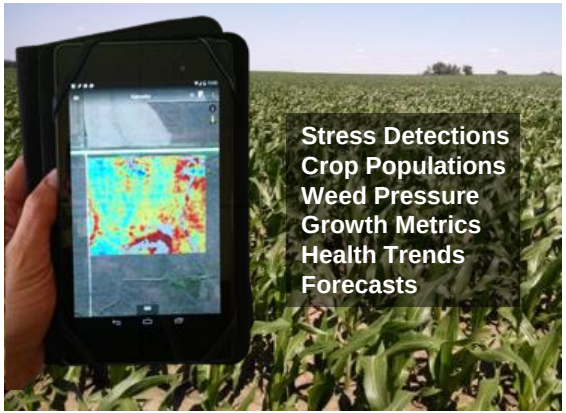
SLANTRANGE

Delivering Valuable New Information for Agriculture

SENSORS
Accurate, Platform-Agnostic



ANALYTICS
On-Board, On-Location



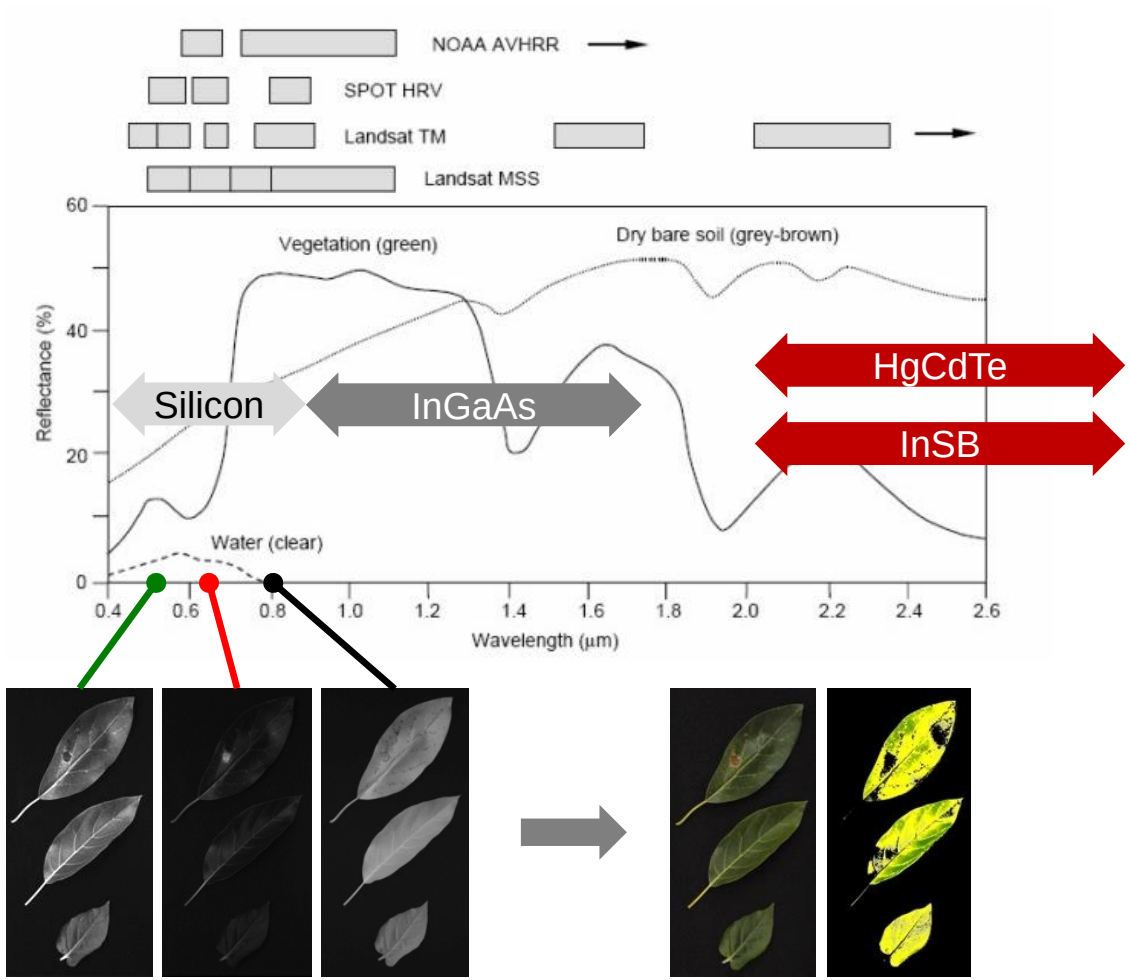
What Provides Information Value?

Information Needs are Diverse

Must Be Accurate, Repeatable, Reliable

Delivered at the Right Time, Place, and Cost

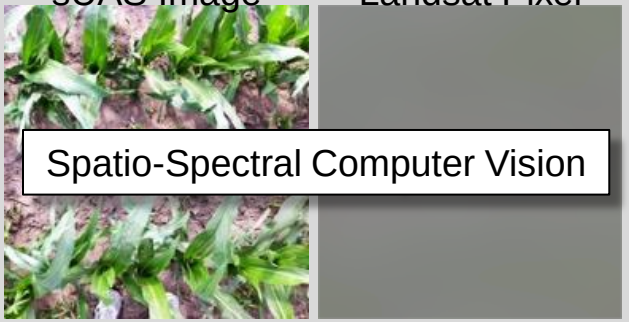
How Can Remote Sensing Deliver Valuable Information?



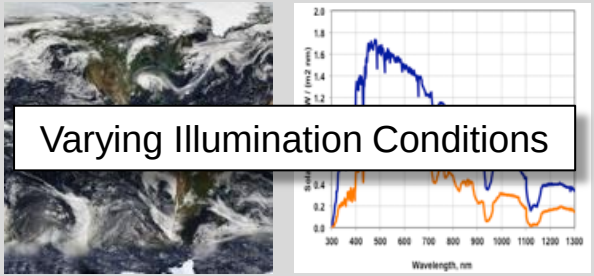
“Slow & Low” Platforms Deliver New Opportunities for Greater Information Value

ON-DEMAND INTELLIGENCE

RESOLUTION



CLOUDS & ATMOSPHERE

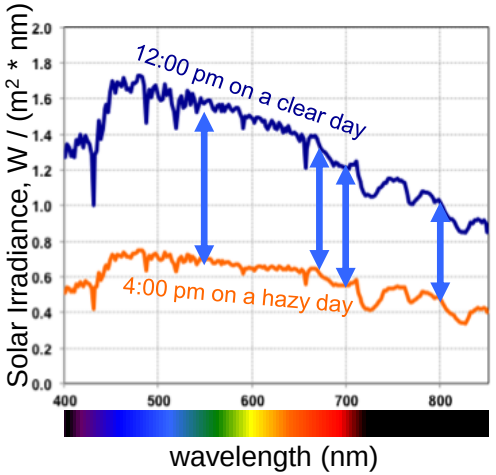


PATENT PENDING

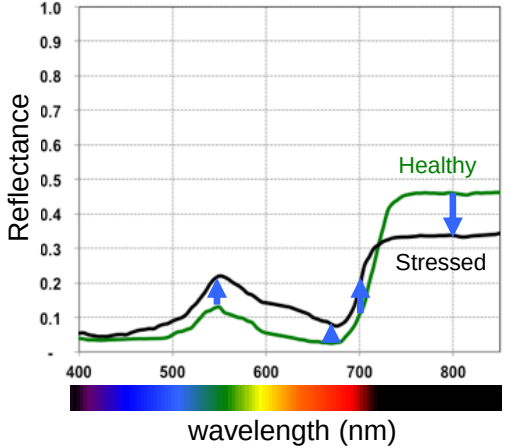
SLANTRANGE Introduced Band-Matched Solar Irradiance Sensors in 2014

An Essential Step for Data Accuracy & Validity

Non-Directional Solar Irradiance Spectrometers



Reflectance Spectrometers

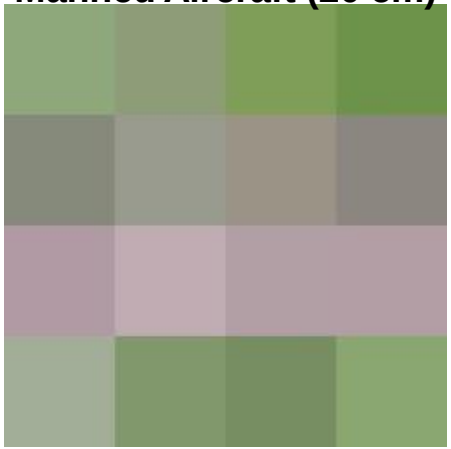


PATENT PENDING

Unlocking the *Real Value* of Improved Spatial Resolution

Satellite (75 cm)

Manned Aircraft (20 cm)



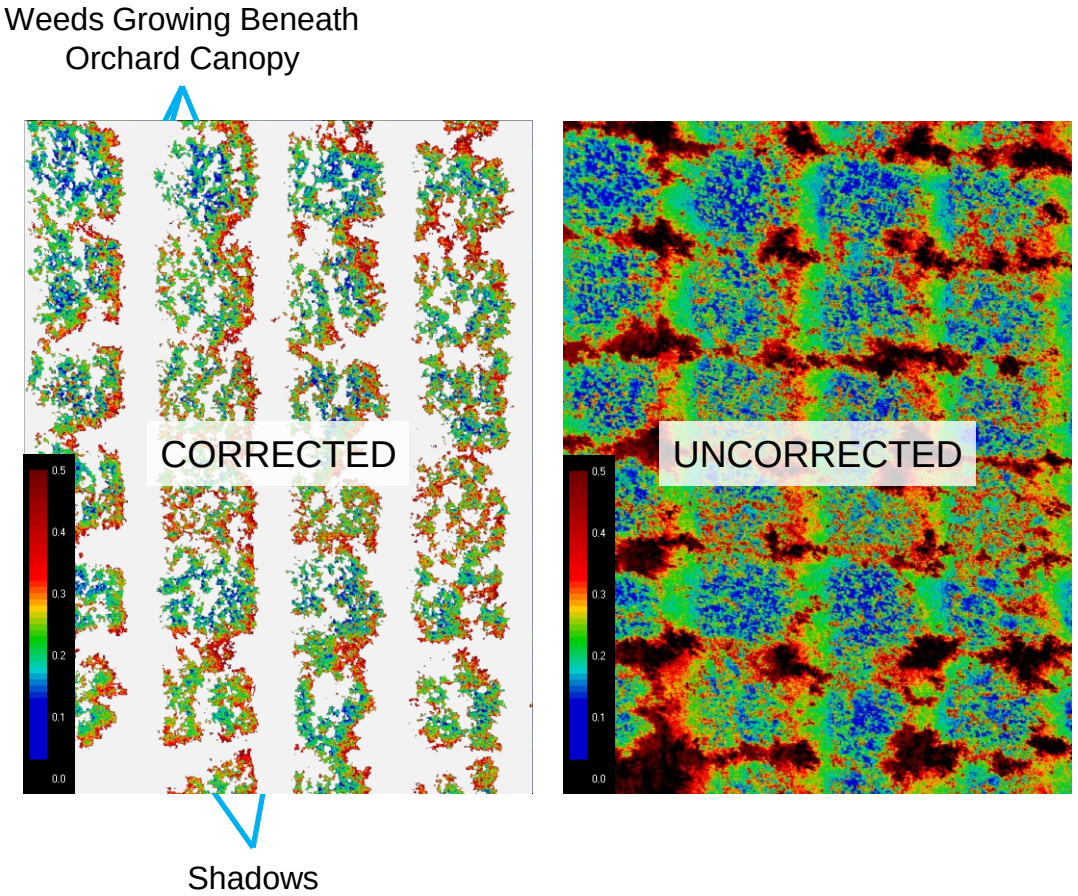
Small Drone (< 2 cm)

Small Drone (< 2 cm)

What Are You Actually Measuring?

Example:

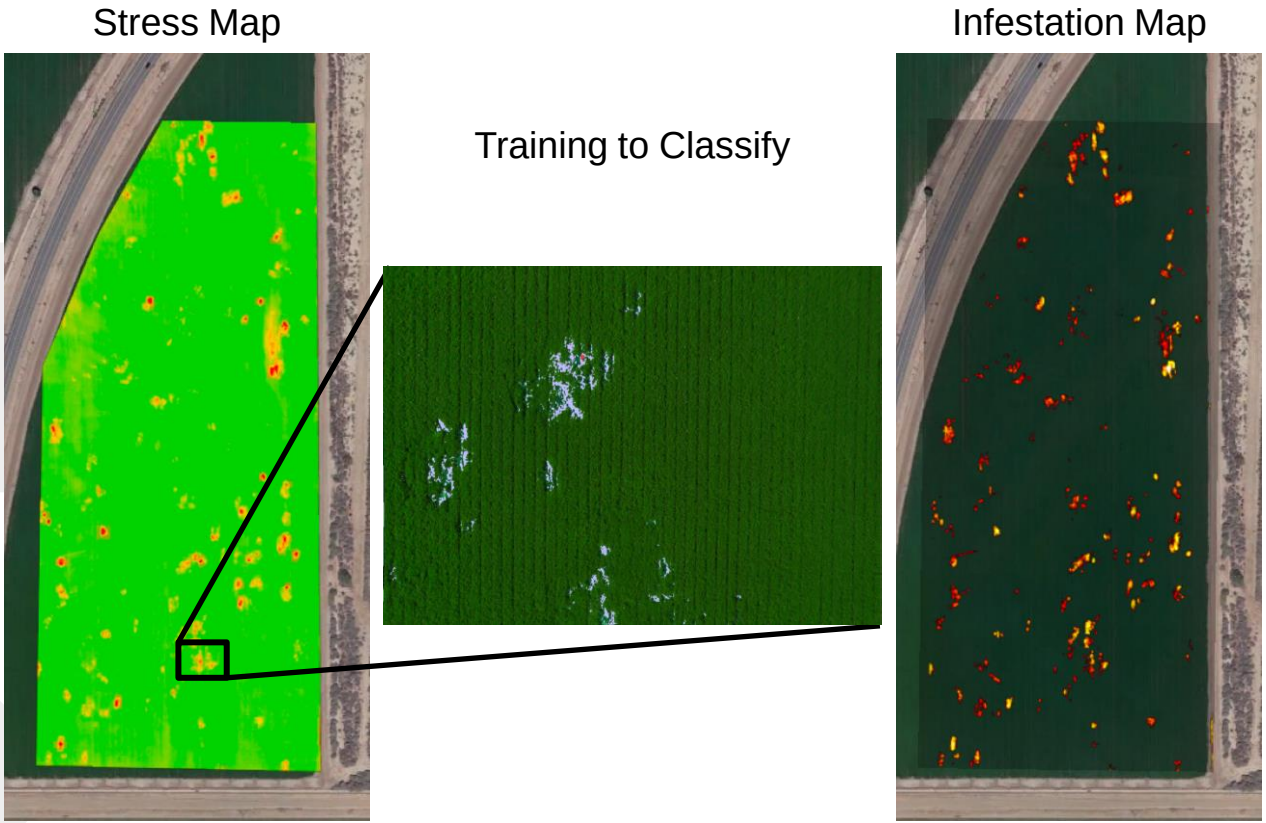
Spatio-Spectral Data Filtering to Assist HLB Detection in Citrus



Training Algorithms to Distinguish Vegetation Types

Example:

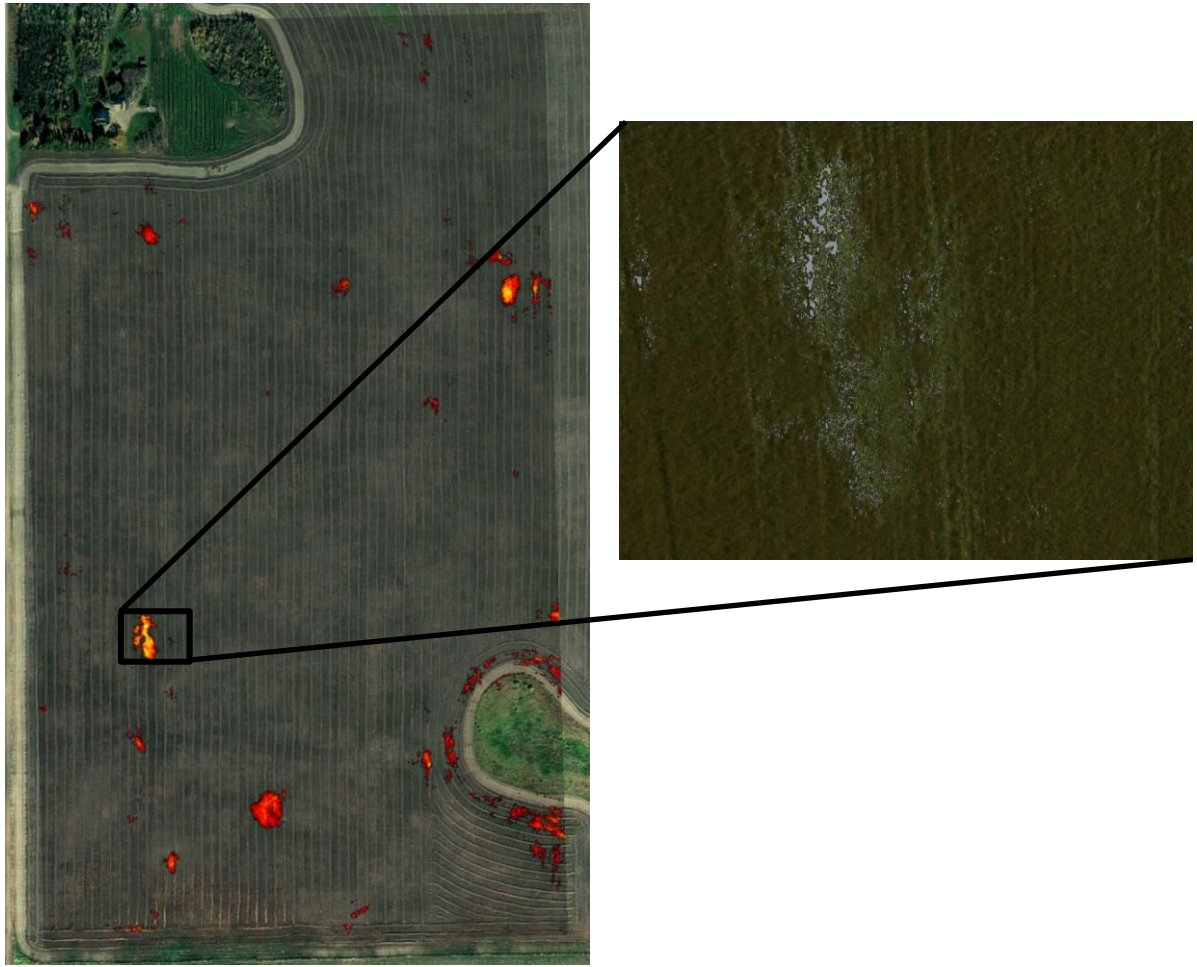
Classifying Noxious Weed Infestation in Alfalfa



Training Algorithms to Detect Lodging

Example:

Lodging in Canola

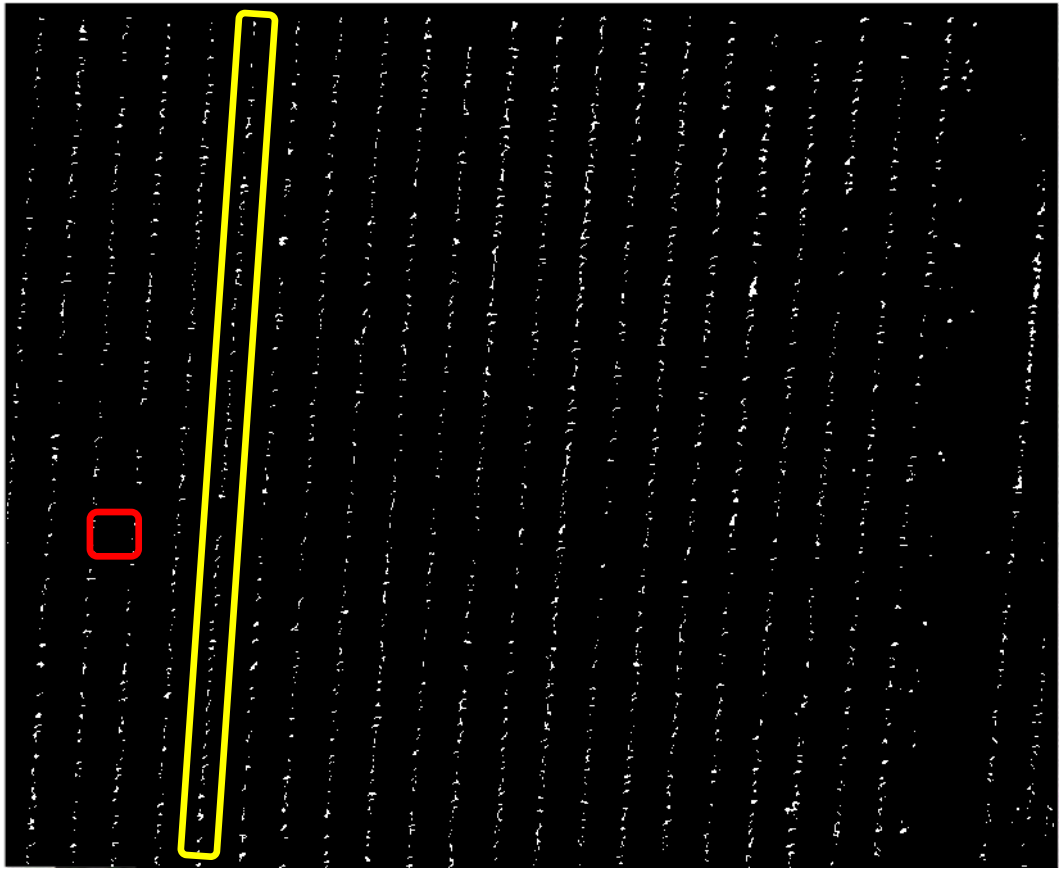


PATENT PENDING

True Plant Counts

Example:

Enabling Growers to Measure Performance Against Plans



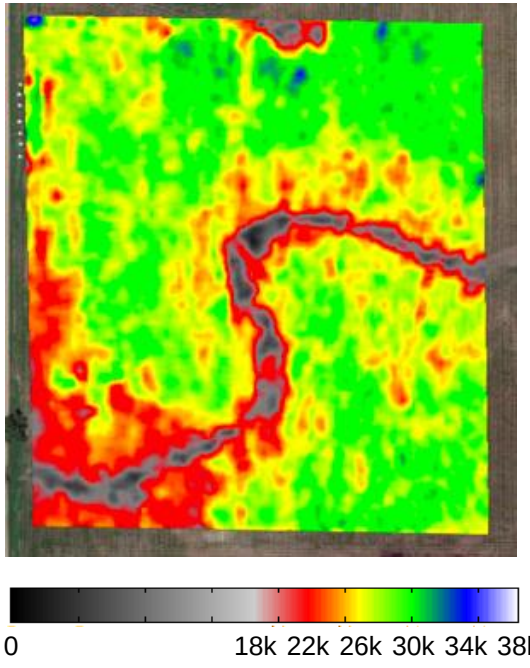
PATENT PENDING

True Plant Counts

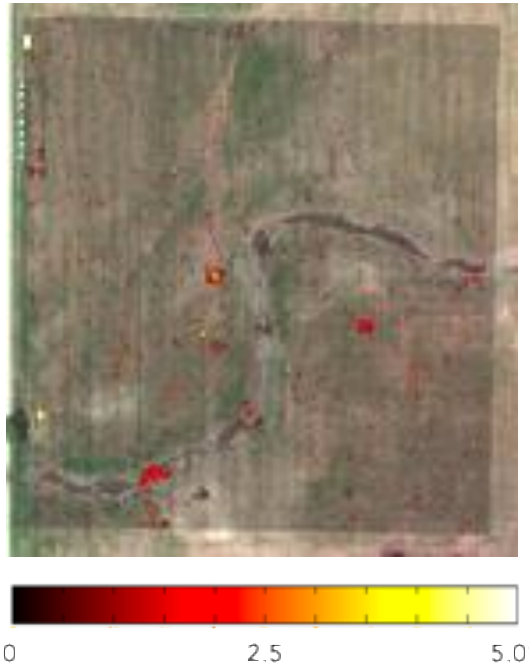
Example:

Enabling Growers to Measure Performance Against Plans

Corn Population (plants/acre)



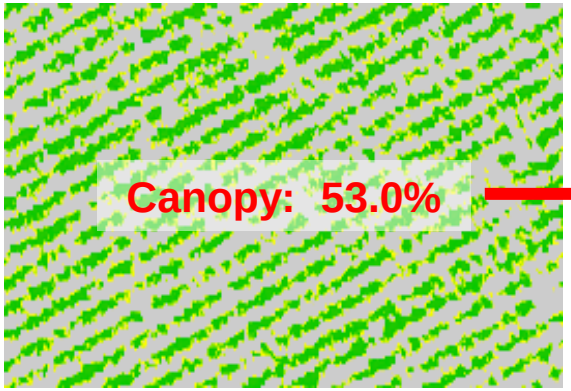
Weed Coverage (percent)

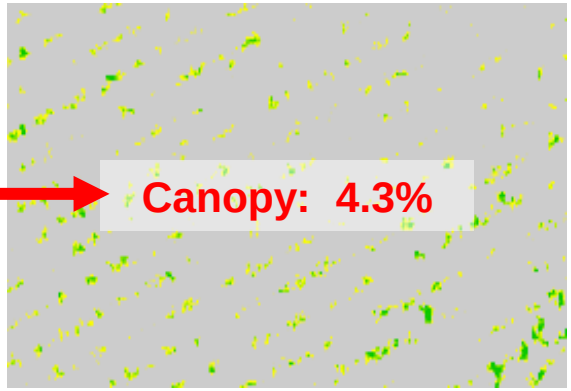


Quantified Weather Damage

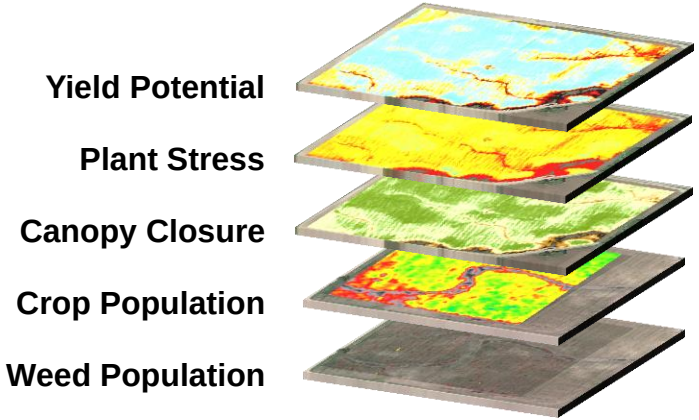
Example:

Enabling Accurate Insurance Claims



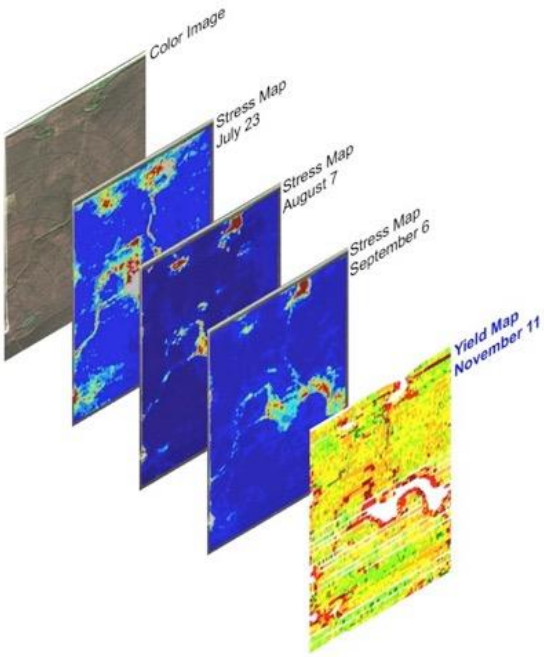


A Mix of Information Layers to Address the Needs of the Grower



Today's Status

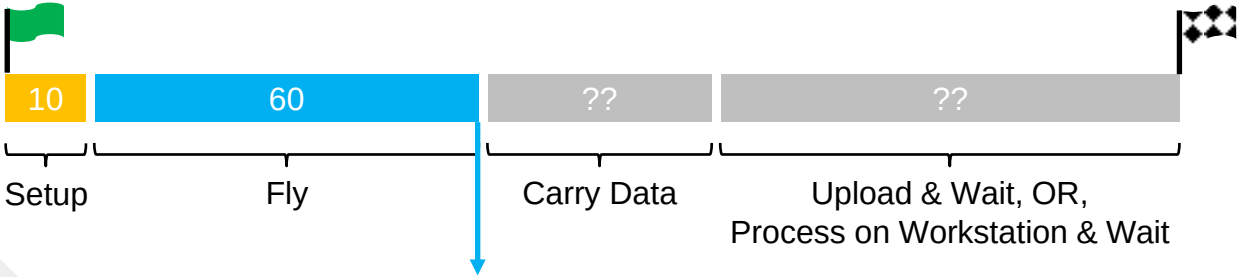
The Time Dimension: Forward & Backward Looks at Condition Trajectories



The Traditional Collection & Processing Workflow

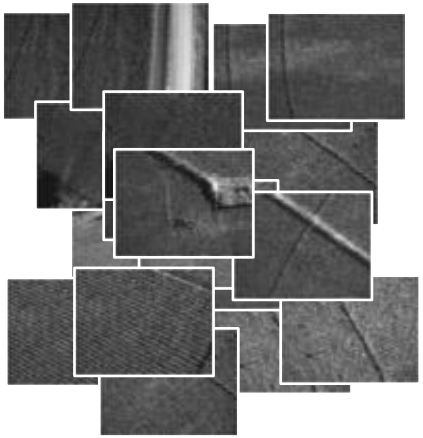
The Mission

Area = 160 Acres
Location = 30 Minutes Away
Sensor = 4x Narrowband Multispectral
Spatial Resolution = 5.0 cm
Altitude = 100 m
Airspeed = 20 m/s
Required Overlap = 80%



60 Minute Flight
32.0 GB Raw Data

Traditional Image Stitching Algorithms Are the Bottleneck



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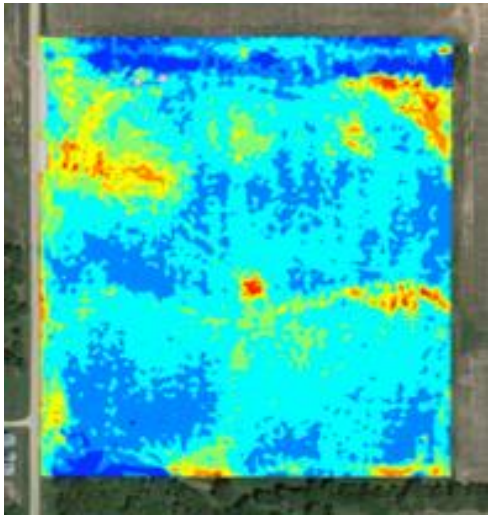


Stitching/Mosaicking

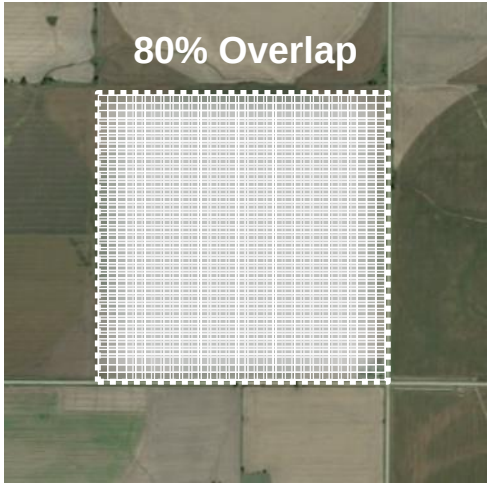
- Spatial Correlation of Periodic Patterns
- Dynamic Scene Content
- Parallax
- Blending
- Compression

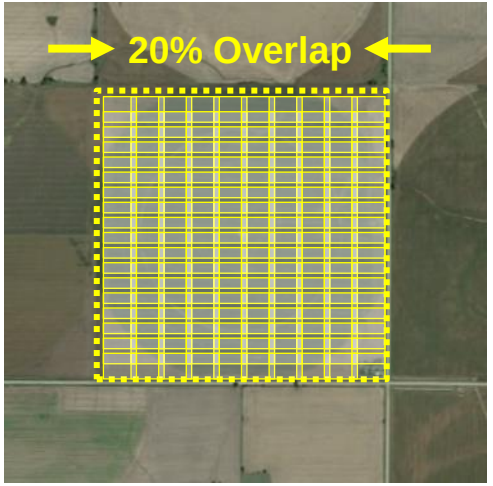
Tiling

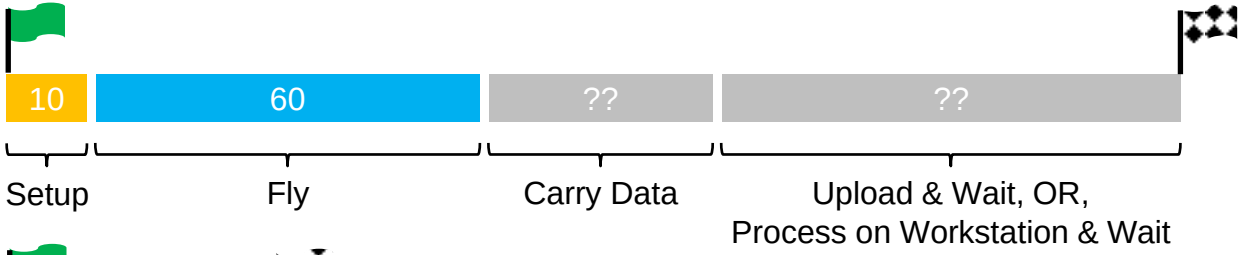
- Placement Accuracy
- Parallax
- Blending
- Compression

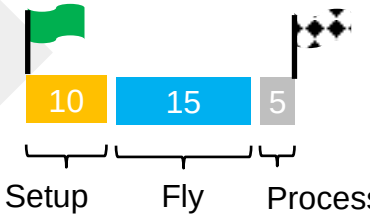
PATENT PENDING

Innovative New Workflow That Works for Agriculture



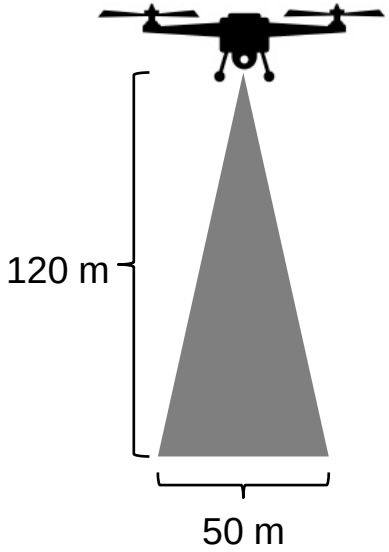






4x Shorter Flight
4x Less Labor in Collection
16x Less Data to Manage

The Simplest Way to Increase Area Coverage

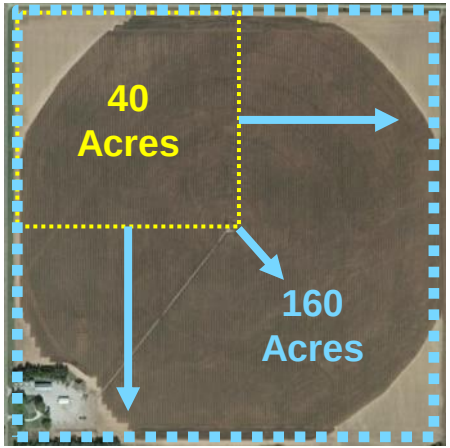


How do we increase area coverage?

FOV limited:

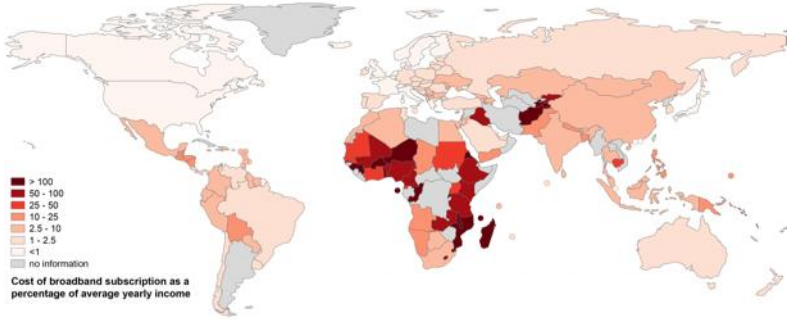
- Narrowband interference filters
- Viewing angle bias
- Parallax

- Increased battery power density?
- On-board recharging (hybrid)?
- Improved flight efficiency?
- Lighter weight?
- ***4x less overlap?***

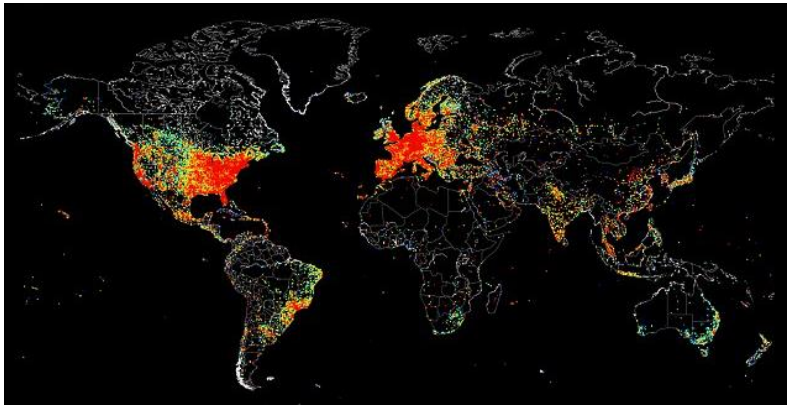


Delivering Technology Value To Where It's Most Needed

Worldwide Broadband Access



Worldwide Computing Reach



New Technology to Produce More Valuable Information for Agriculture

Accurate, Reliable Measurements

Valuable New Information

Processed in an Efficient and Scalable Way