

MicaSense®

Reap the smartest harvest

► High-quality, multispectral imagery that soars above the rest



► Professional remote sensing solutions

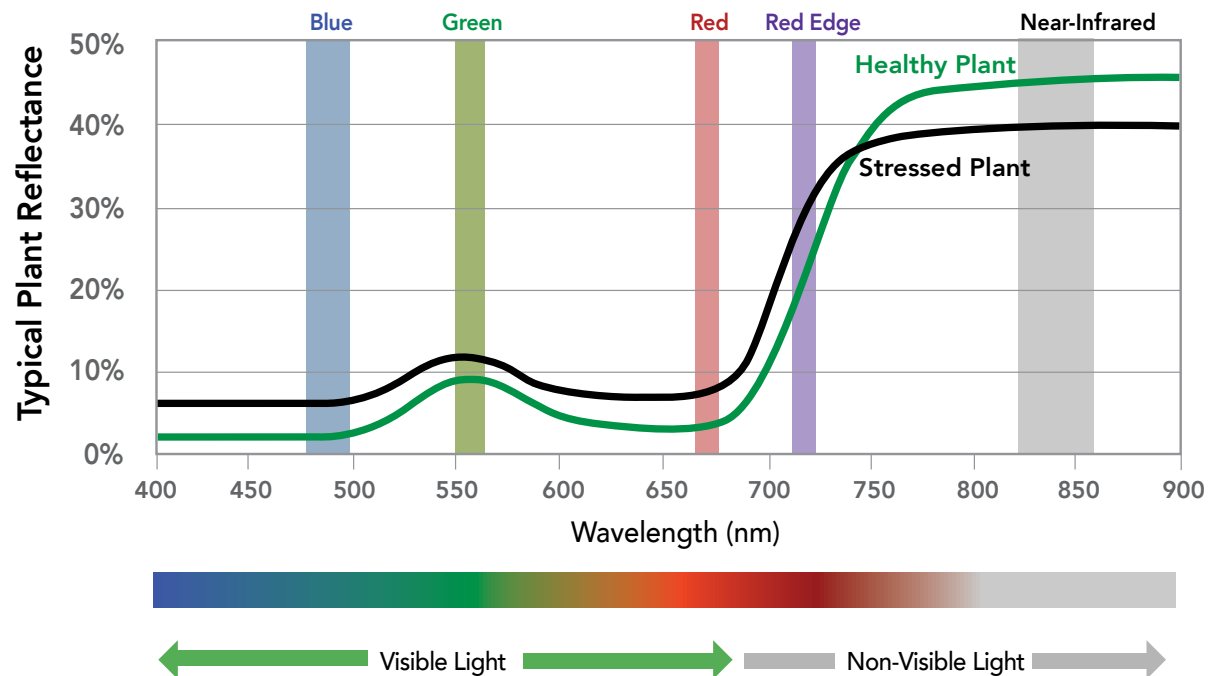
New technologies are revolutionizing the use of remote sensing in agriculture. The widespread availability of low-cost unmanned aircraft enables agricultural professionals to cost-effectively gather crop health information. Imagery can be collected at resolutions measured in just inches per pixel. Data captured on a frequent basis enables growers and agronomists to map the health and vigor of crops today as well as observe changes in crop health over time.

MicaSense® delivers technologies that enable this revolution.

Solid science, no guesswork

Plants reflect light in a predictable pattern across the color spectrum. These patterns are correlated to crop vigor and stress as well as nutrient information.

Multispectral imaging uses cameras with narrowband filters to optimally sense plant reflectance, delivering the information needed to assess the status of your crops. This capability enables growers and agronomists to alter nutrient inputs and take action to address disease based on actual field conditions.



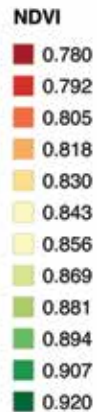
RGB color composite



Better data means richer insights

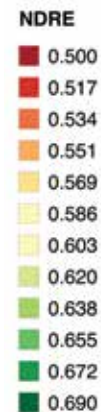
Multispectral imaging enables the collection of data in both visible and non-visible bands of light, allowing for generation of RGB color composite imagery as well as vegetation indices.

NDVI



NDVI (Normalized Difference Vegetation Index) reveals variability in plant vigor and biomass, oftentimes not visible in standard RGB color imagery.

NDRE



Advanced vegetation indices like NDRE (Normalized Difference Red Edge) are more sensitive to changes in leaf chlorophyll content and provide information about plant nutrient status.

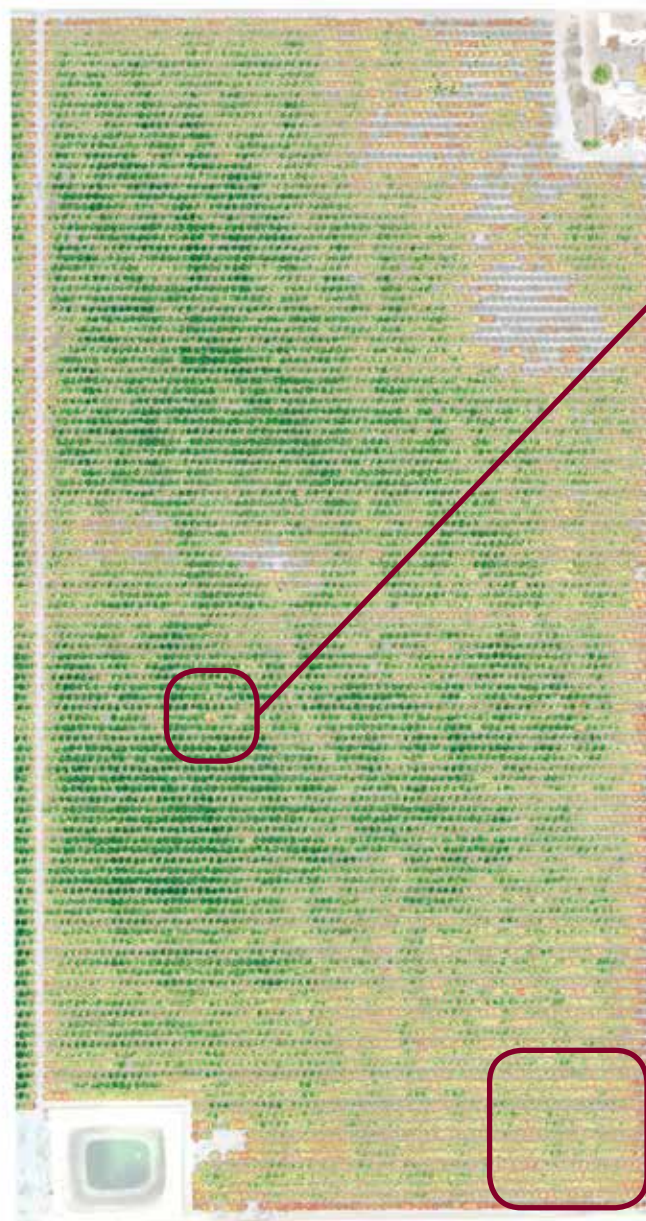
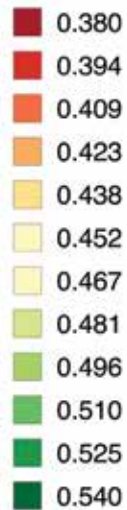
Case Study:

A California almond grove

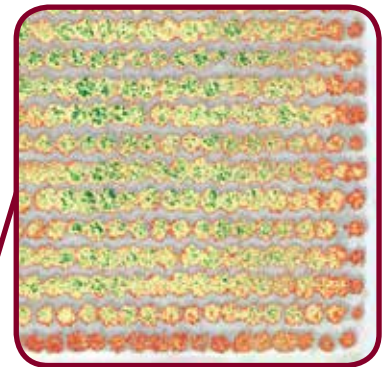
▶ Tracking growth and detecting disease

An almond grower in California used MicaSense multispectral solutions combined with field scouting to pinpoint specific trouble areas. Time-based trends provided even more powerful insights, revealing areas of faster change in crop vigor that would have gone unnoticed otherwise.

NDRE



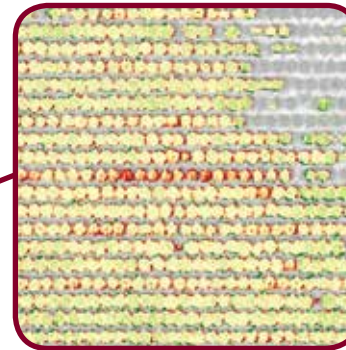
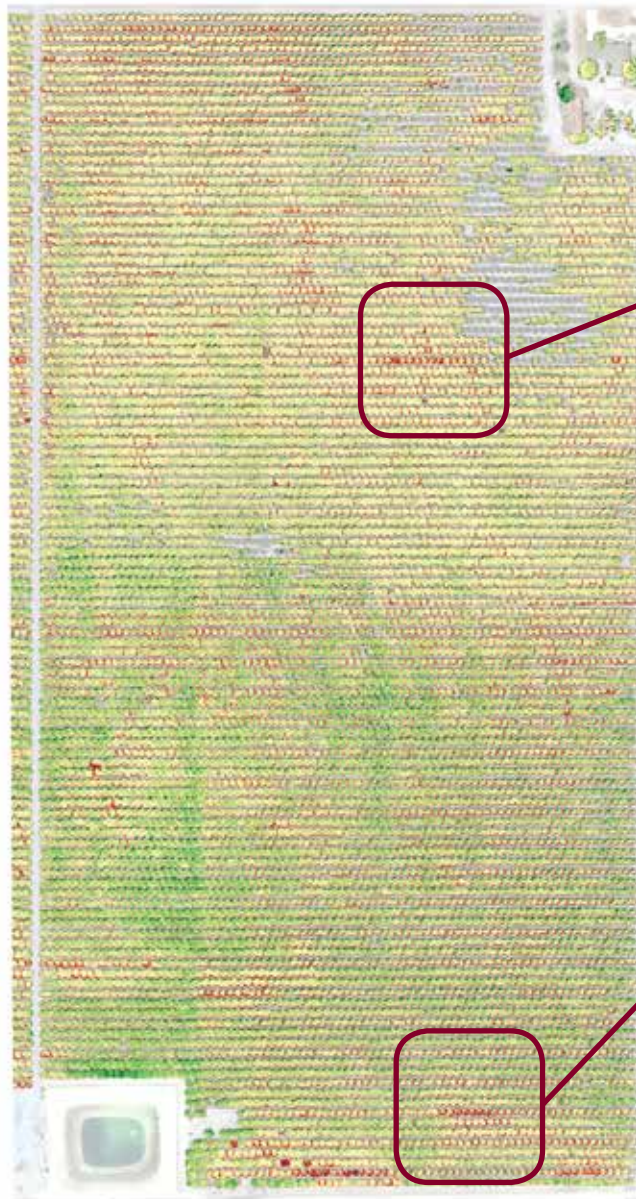
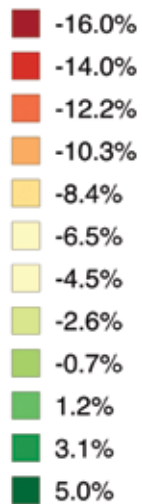
A specific tree is identified as potentially affected; walking to it reveals a disease that had not been noticed before.



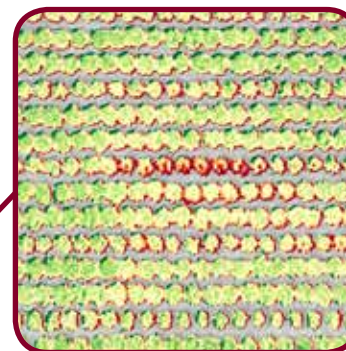
Precise multispectral imaging enables detection of subtle variations in plant vigor, such as trees that have more dust on their leaves due to their proximity to dirt access roads.

MicaSense helps a grower detect previously unnoticed variability

Change in
NDVI



Time-based analysis of multispectral data reveals even more. Comparison of the change in NDVI over the course of three weeks shows areas with a drastic decrease in vigor. These areas correlate with deficiencies in application of water and nutrients.



Courtesy: All Drone Solutions, Exeter, CA

Case Study:

Soybeans in the Midwest

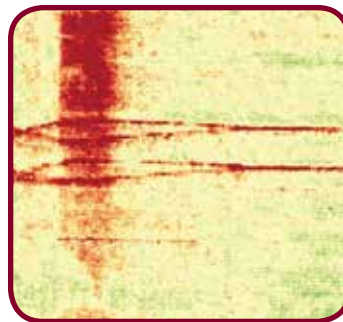
► Tracking micronutrient and herbicide effectiveness

This soybean farm leverages multiple forms of precision agriculture to optimize yields and minimize costs. Multispectral data reveals the effectiveness of herbicide applications and three different types of micronutrient treatments.



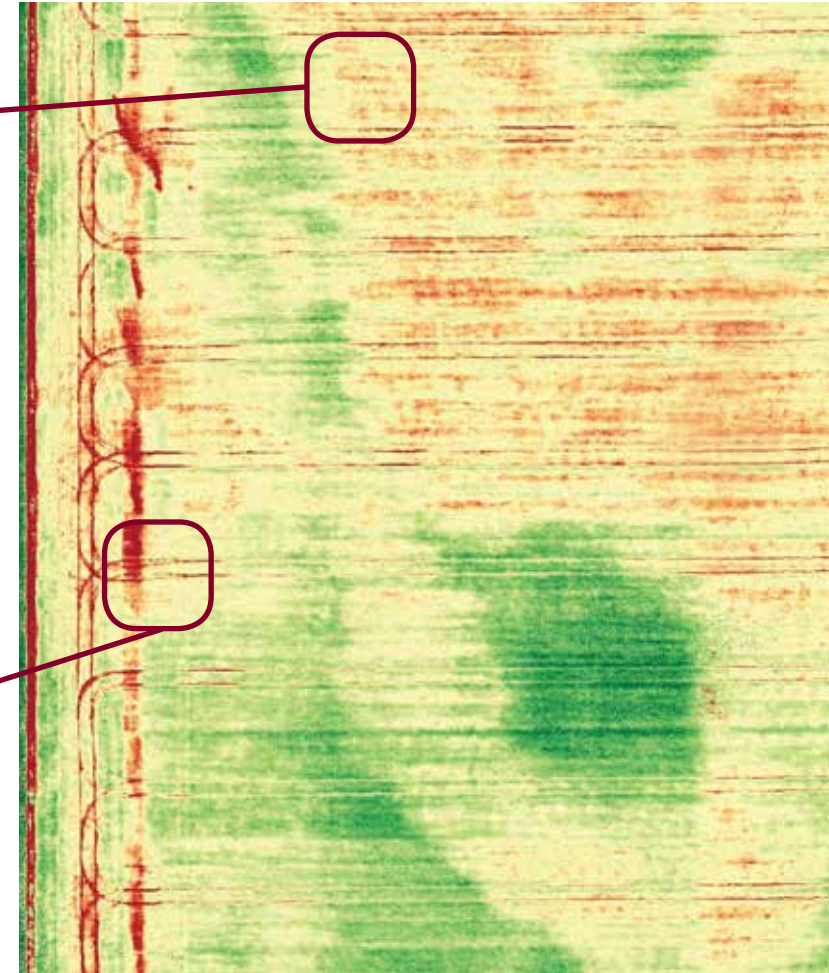
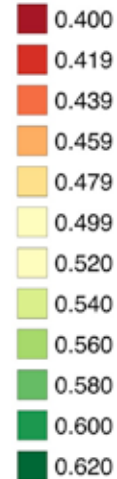
Courtesy: Kansas State University Research and Extension

Damage (burning) of leaves caused by DPE-based herbicide application over the upper section of this field.

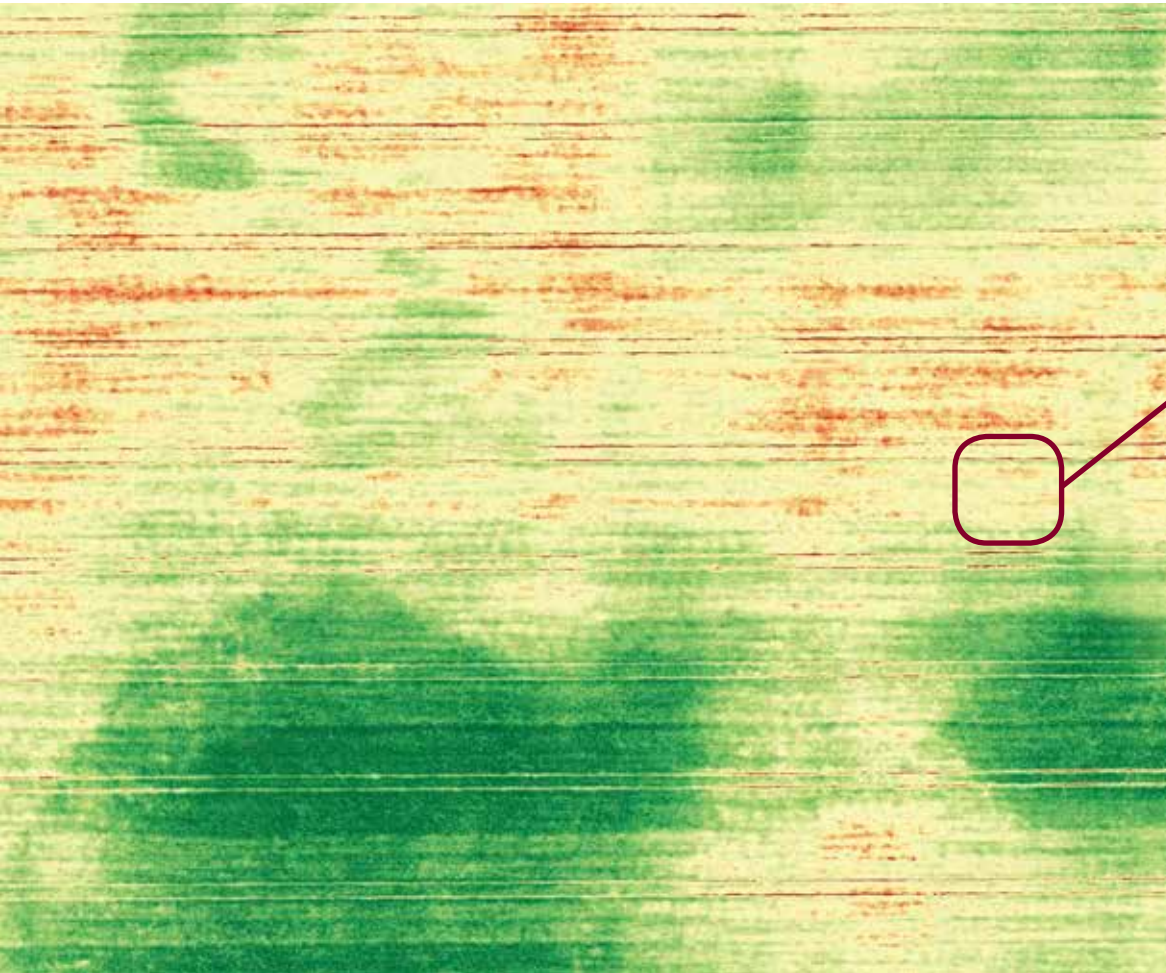


NDRE vegetation index reveals micronutrient overspray at the ends of the rows.

NDRE



{ A farmer in Minnesota experiments with micronutrient application



Courtesy: Martin Chilvers

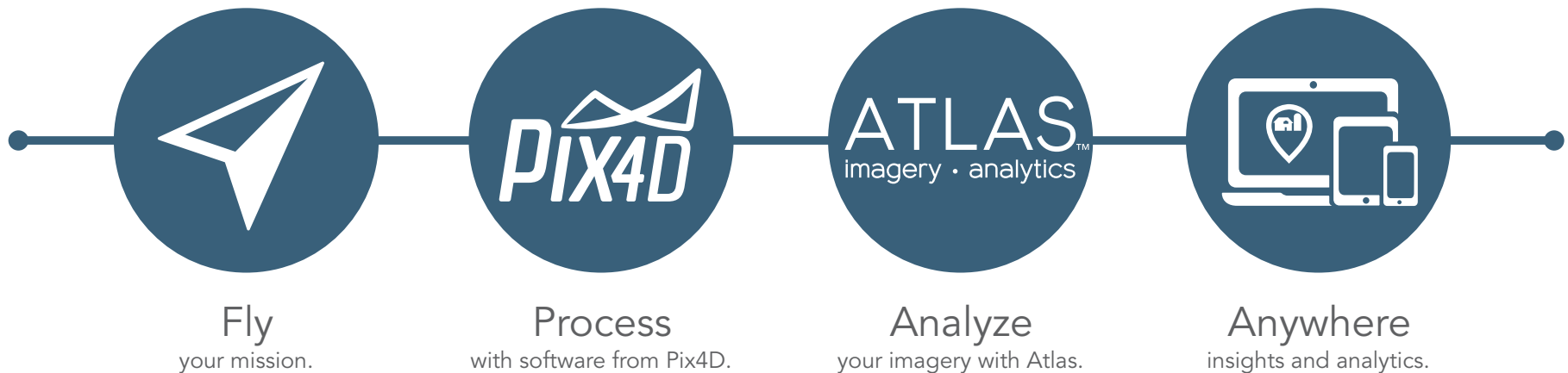
Areas of the crop affected by white mold can be identified, even though symptoms of the disease are only seen on the stems of the plants and are not yet visible in the leaf canopy.

Micronutrient applications are monitored: three different types are tested on three rows.

Courtesy: Leading Edge Technologies, Winnebago, MN

► MicaSense Atlas™: When data becomes information

Intelligent analytics harness the power of smart sensors. Atlas is a simple-to-use, cloud-based platform built to provide intelligent solutions for precision agriculture. Take your processed data and turn it into actionable information using powerful analytics and visualization tools. Backed by the cloud, this dynamic platform allows for easy sharing and mobile access.

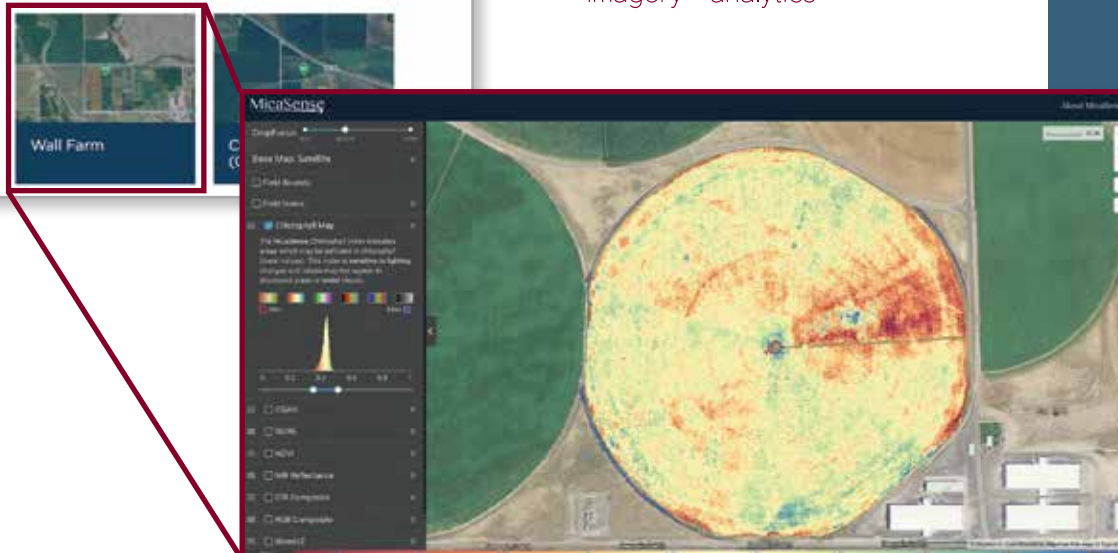
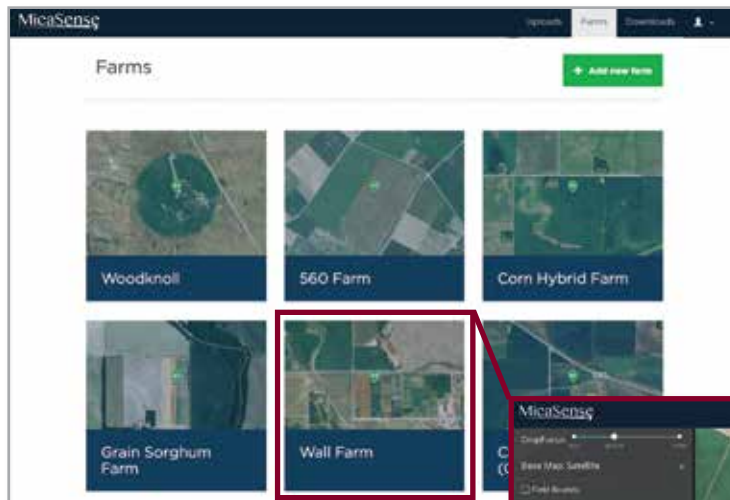


How do Atlas and Pix4D work together?

In Pix4Dmapper Pro and Pix4Dag, there is a feature that allows you to upload processed reference maps to MicaSense Atlas. After uploading, analyze your data and take it into the field for informed scouting, then export it or share with colleagues.

Effortless organization

Manage your data the way you manage your farm. Create farms and define field boundaries within an intuitive user interface. Atlas handles the rest, automatically organizing processed outputs with no manual pre-filtering or sorting.

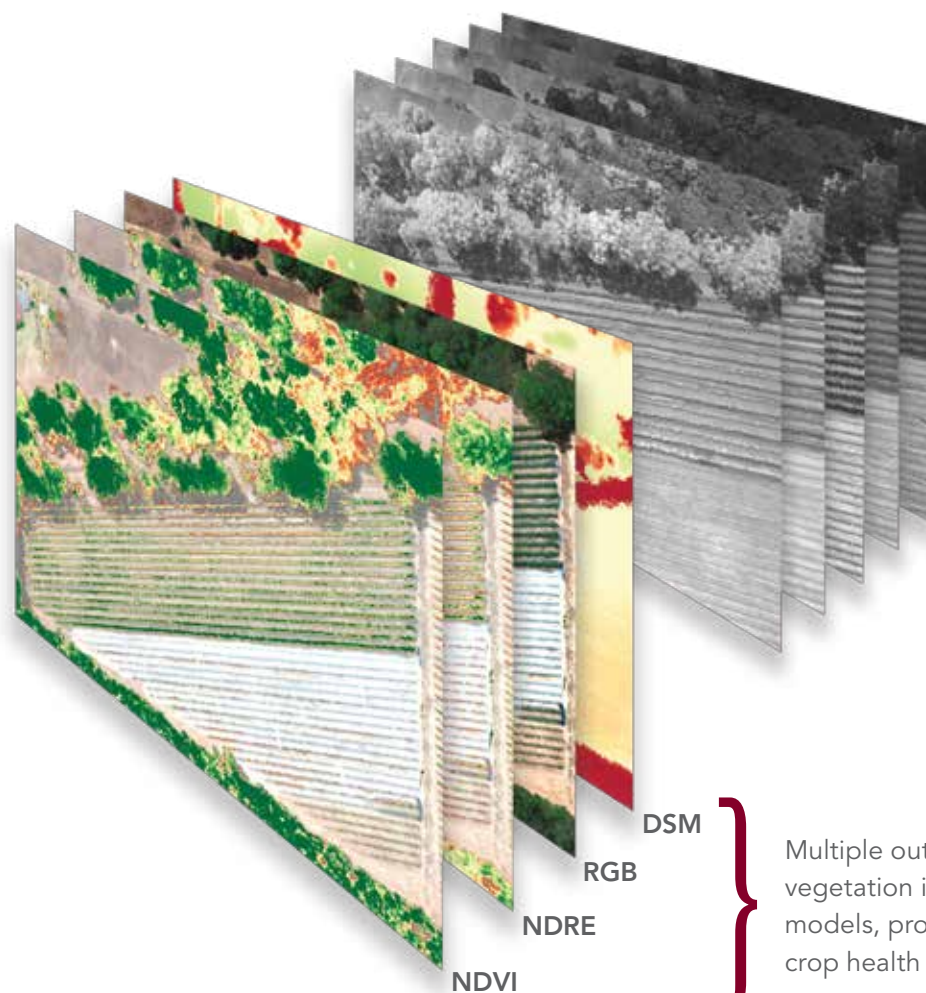


► It's your data

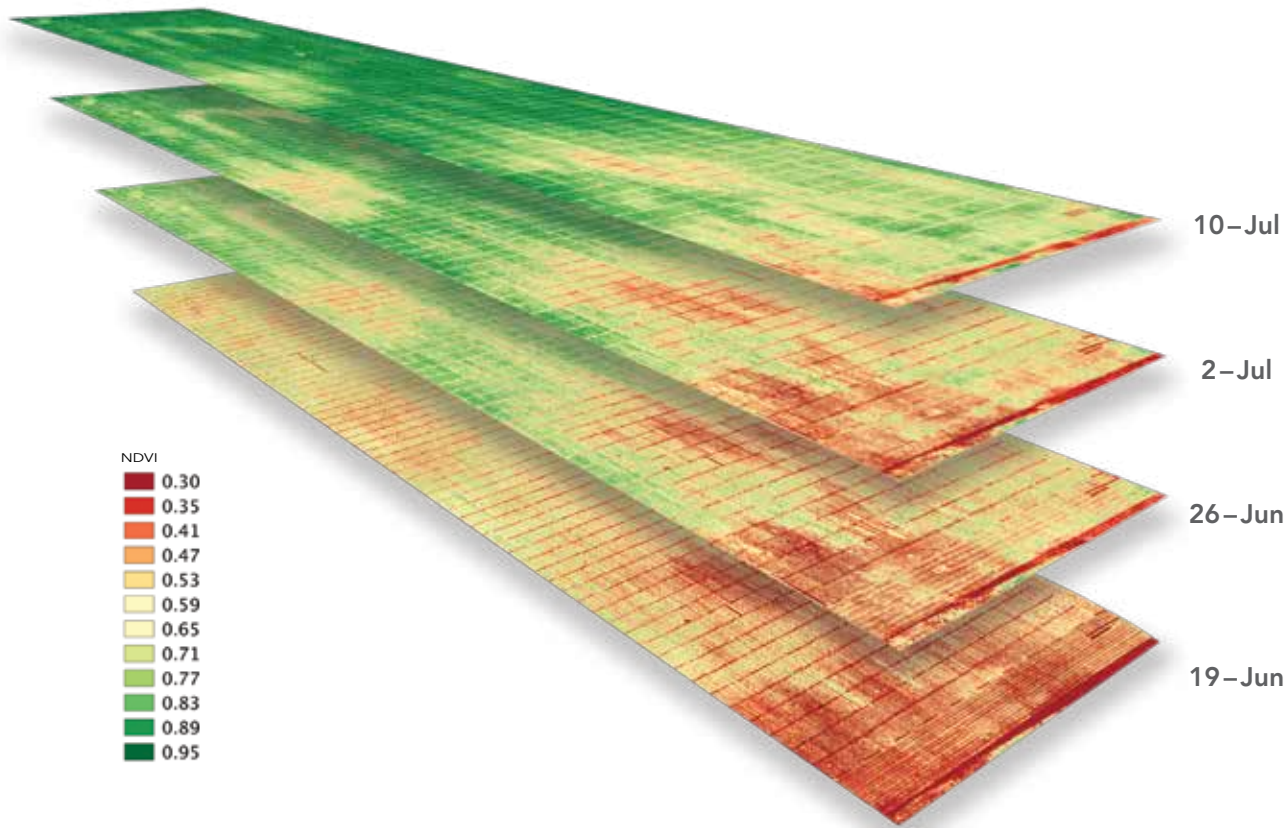
We are committed to protecting the privacy and ownership of your data. Take advantage of the MicaSense Atlas cloud-based solution knowing your information is safeguarded and will never be shared without your permission. Atlas provides unlimited storage for your data, securely housed in US-based cloud servers.

► Transform your multispectral imagery into actionable information

Atlas offers multiple output options for extracting the most information from multispectral imagery. Color composite orthomosaics, vegetation index maps (like NDVI and NDRE), MicaSense chlorophyll map weed detection layers, and digital surface models are all standard outputs offered in Atlas.



Multiple output layers include rendered vegetation index maps and digital surface models, providing insightful information into crop health at all stages of growth.



Time reveals more

Atlas features intuitive tools for quick scanning through all available data sets in a field. Calibrated outputs and easily accessible data enable detection of changes in field conditions across time, to more confidently identify problem areas.

► Collaborate and share

Want to share your latest crop health map with your team? Atlas gives you the capability to share color mosaics and vegetation index maps via web link, or to download a multilayer file for advanced analysis in GIS applications.

► Faster field scouting

View crop health maps in the field from any connected portable device. The Atlas geolocation tool shows your position in the field to guide your scouting.



{ Seamless presentation in one intuitive interface

Multiple export options
including five-layer
GeoTIFF and DSM

Easily share imagery
with clients, teams,
and consultants

**Make notes
and add photos**
from the field or
the office

**Pinpoint stress, identify disease,
and highlight subtle variation**

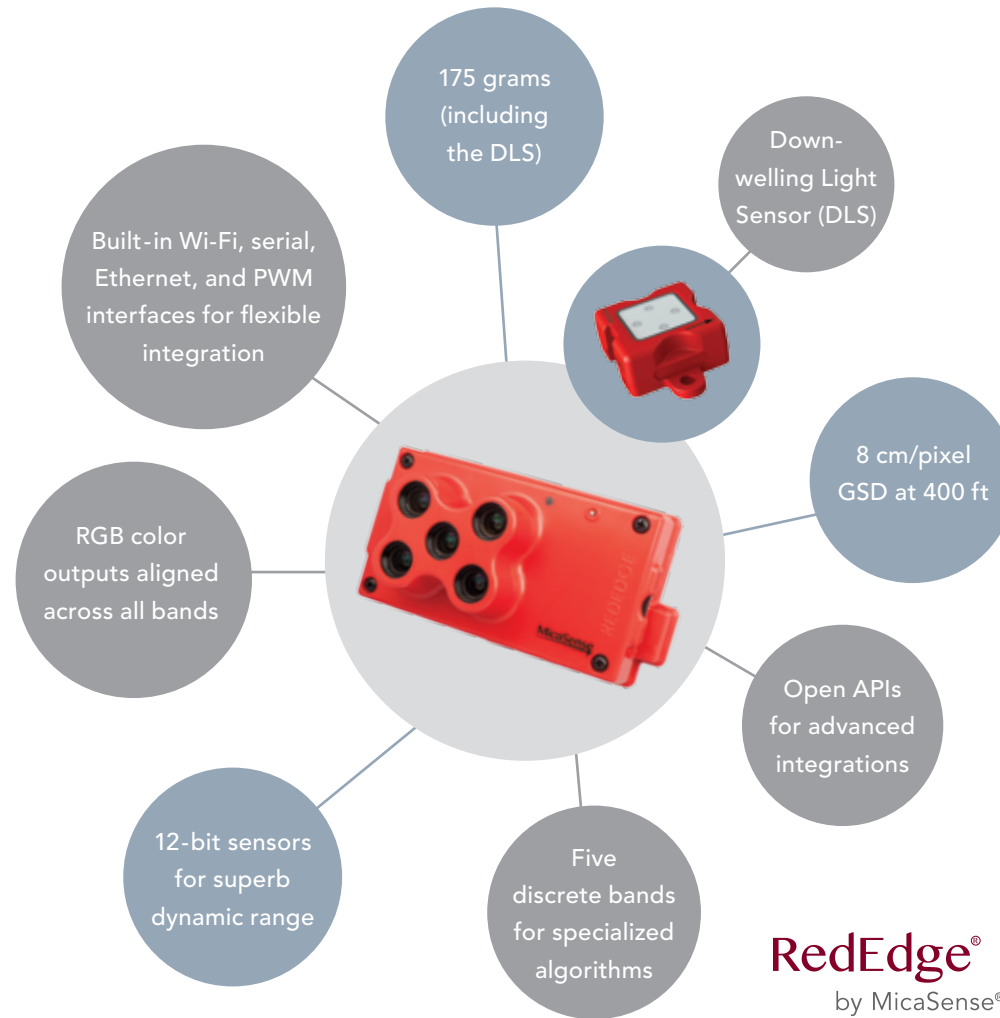
**GPS-guided
scouting**

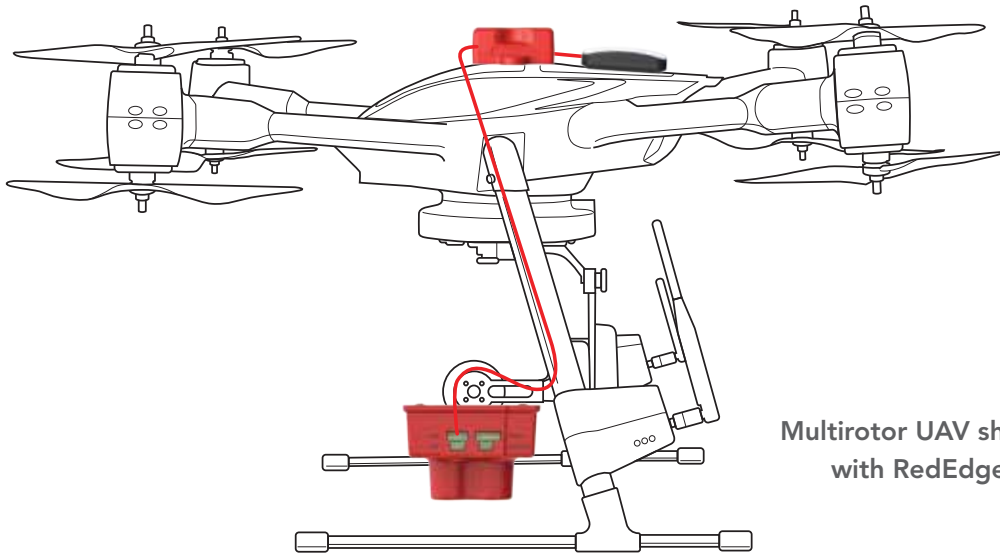
**Explore seasonal
data and track
change over time**

ATLAS™
imagery • analytics

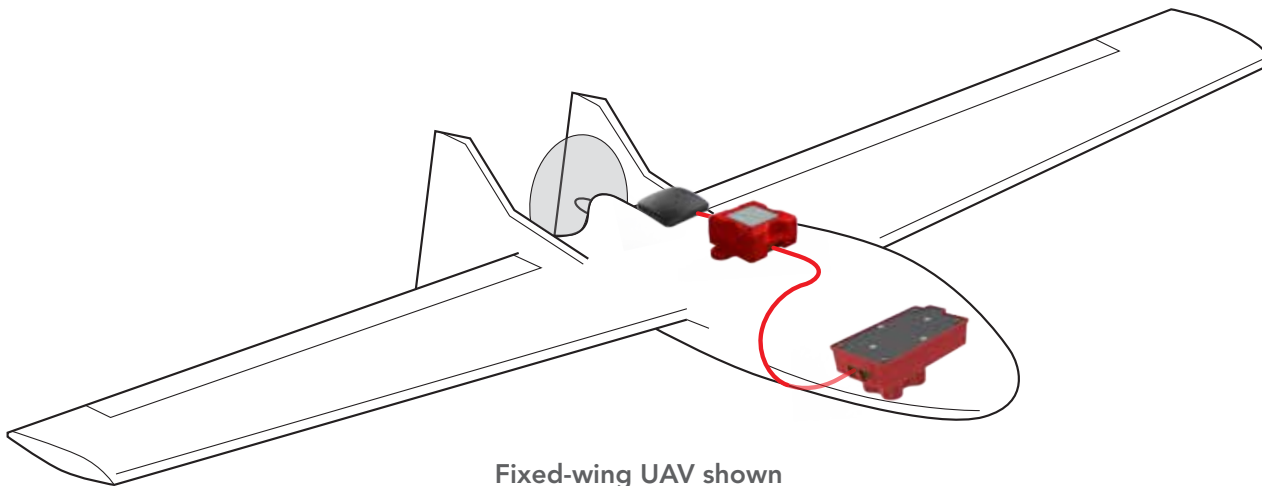
► Advanced multispectral sensors for better data

Accurate information for your fields starts with quality sensors. MicaSense offers professional multispectral cameras optimized for use in drones, with narrowband filters, calibrated outputs, and a size and weight that allow integration with all types of drones. The RedEdge® camera along with MicaSense Atlas provides you with a complete remote sensing solution.





Multirotor UAV shown
with RedEdge



Fixed-wing UAV shown
with RedEdge

► Seamless integration across all platforms

With flexible interfaces
including Ethernet and serial,
RedEdge is ready for tight
integration with any drone.



RedEdge over the Greenland ice sheet
Photo credit: Urs A. Treier, Aarhus University

MicaSense®

At MicaSense, we're at the forefront of multispectral sensor development, and together with our customers, we're pushing the boundaries on agricultural data analysis. We get the right tools into your hands so you can make the right call at the right time. We're here to work with you, because we know that you're experts in your field, just like we are in ours.

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