Reap the smartest harvest

- High-quality, multispectral data that soars above the rest
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.

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.

**Solid science, no guesswork**

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

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.

Better data means richer insights

Multispectral imaging enables 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.
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.

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.
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.

MicaSense helps a grower detect previously unnoticed variability

<table>
<thead>
<tr>
<th>Change in NDVI</th>
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<tbody>
<tr>
<td>-16.0%</td>
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<td>-14.0%</td>
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<td>-12.2%</td>
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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.

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

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

Courtesy: Kansas State University Research and Extension
A farmer in Minnesota experiments with micro-nutrient application.

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.
ATLAS™ is a cloud-based solution that enables you to get the most out of imagery captured with multispectral sensors. Your raw data is processed into accurate and powerful crop health maps that can be accessed from any internet-connected device.

**Fly your mission:** Capture imagery over your fields using any drone with grid survey mapping capability.

**Securely upload your raw data:** Use the MicaSense Uploader Application – no need for organizing, post-processing, or filtering of files and folders.

**Accurate crop—health maps created:** Cloud-based servers automatically process your data and convert it into powerful information maps. Most uploads complete processing within one day.

**View and manage your data from anywhere:** Processed results are available for viewing in any connected device, organized in your defined farms and fields. Scout in the field or share with your farm management team.
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 raw data 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), and digital surface models are all standard outputs offered in ATLAS.

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

ATLAS transforms raw images into geo-referenced multi-layer orthomosaics, which can be downloaded and viewed using standard GIS applications. Each layer is registered at the sub-pixel level, with the value for each pixel indicative of percent reflectance for that band.
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 multi-layer file for advanced analysis in GIS applications.

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.
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

Easily access data from all your farms and fields

Geolocation tool enables in-the-field scouting

Share data with your team for effective collaboration

Use the slider to flip across multiple data sets and identify trends over time

Easily select map layers

Need help? US-based support is a click away
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: RedEdge™ by MicaSense and Sequoia by Parrot. Featuring narrowband filters, calibrated outputs, and small size and weight, RedEdge and Sequoia coupled with MicaSense ATLAS provide your complete multispectral remote sensing solution.

**RedEdge™ by MicaSense**
- 168 grams (with irradiance sensor)
- 8 cm/pixel GSD at 400 ft
- Open APIs for advanced integrations
- 12-bit sensors for superb dynamic range
- Five narrow bands for custom algorithms

**SEQUOIA**
- 107 grams (with irradiance sensor)
- 11 cm/pixel GSD at 400 ft
- Built-in WiFi, serial, Ethernet, and PWM interfaces for flexible integration
- USB interface (PTP) + WiFi
- Integrated GPS module in Irradiance Sensor
- Small and lightweight for use in small drones
- High resolution RGB for field scouting

NOTE: Images are not shown to scale.
With its compact size and weight, Sequoia is a great fit for low-cost multi-rotors and small fixed-wing platforms. With flexible interfaces including Ethernet and serial, RedEdge is ready for tight integration with any drone.
Located in Seattle, Washington, MicaSense delivers integrated solutions for data gathering, processing, and analytics across the global agriculture market. With decades of expertise in widely varied UAV applications, the MicaSense team is redefining remote sensing technology and pioneering new ways to collect and analyze information.