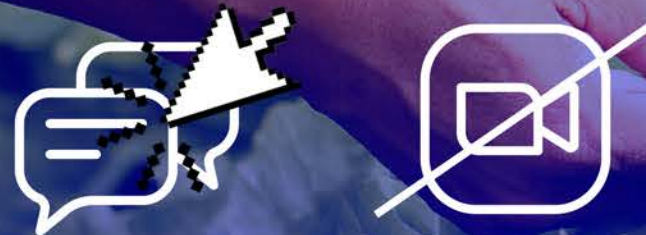


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WELCOME TO THE  
**MULTISPECTRAL &  
HYPER SPECTRAL IMAGING**  
IN AGRICULTURE  
WEBINAR



*Please turn off your video, open your chat,  
and ask any questions in the chat*



Jonathan Hackney

Director of Sales for  
the West Region



*Computar brand launch, 1981*

# MEET THE EXPERTS

- Jonathan has a history of working in the industrial automation industry
  - Enjoys talking & learning about technological advancements, especially machine vision
- Computar has 40+ years of innovative optics using Japanese engineering & global agile production facilities

# OUTLINE

1. Intro
2. Multispectral Imaging
3. Hyperspectral Imaging
4. Hyperspectral Imaging in intelligent farming
5. Drones in Agriculture
6. Multi- and Hyperspectral Imaging for Research
7. Additional Applications
8. The Importance of the Lens for Multispectral and Hyperspectral Imaging
9. Computar ViSWIR Series: See Past the Visible
10. Other Recommendations
11. Q & A



# Introduction

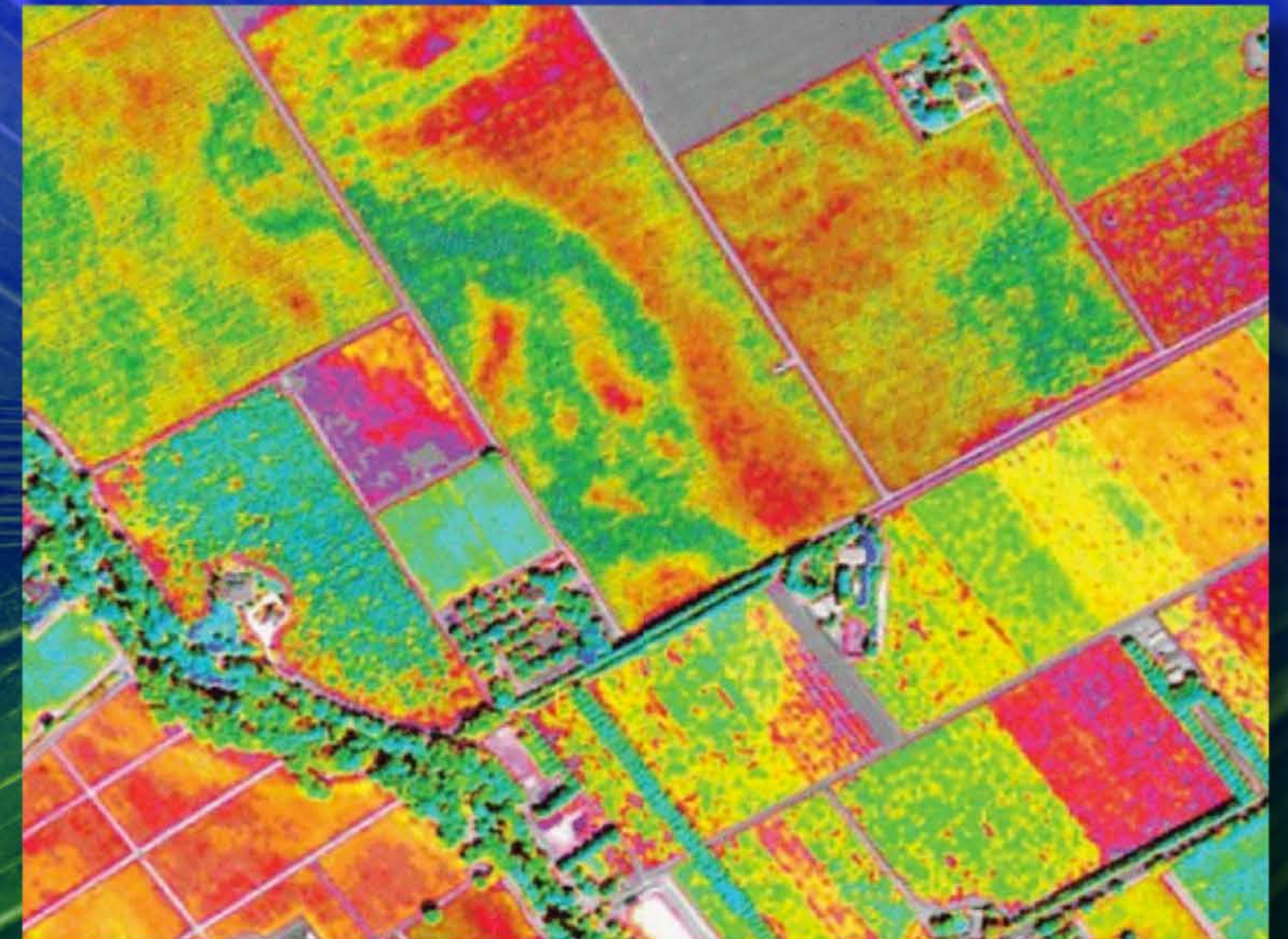
Multispectral and hyperspectral imaging technologies have significantly impacted agriculture by providing farmers with valuable data and insights about their crops.

These imaging techniques can detect:

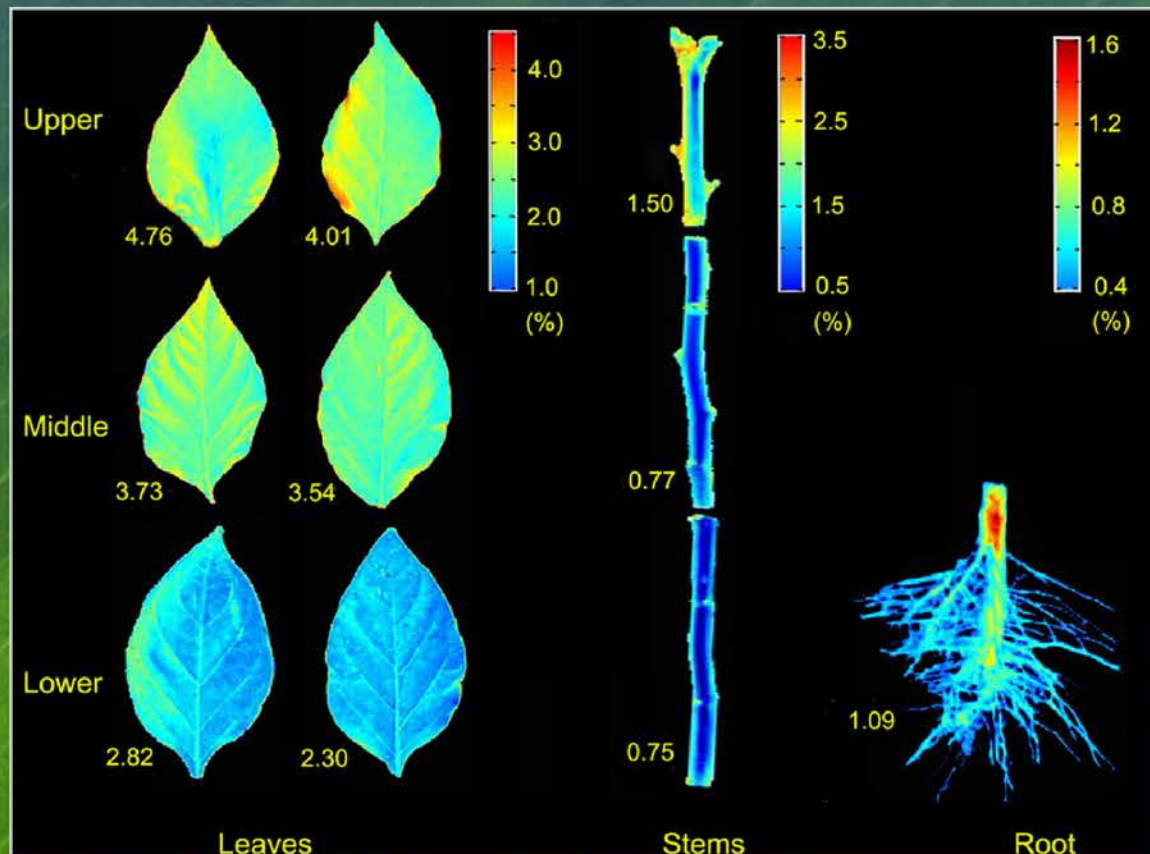
- Plant health
- Moisture levels
- Nutrient content
- Identify & prevent disease outbreaks, leading to higher crop yields & better-quality produce

# Multispectral Imaging

- Mapping soil properties
  - Moisture content
  - Organic matter content
  - Mineral composition
  - Analyze soil erosion
- Classification of crop species
- Detecting crop water stress
- Monitoring of weeds and crop diseases
- Mapping & estimating of crop yield
- Measure extent of frost or heat damage



# Hyperspectral Imaging



- Hyperspectral images can go one step further and diagnose the exact reason for that state
- Can be used in intelligent farming to analyze crops and soil
- Hyperspectral imaging captures images at many narrow, contiguous wavelength bands across the electromagnetic spectrum, typically in the visible, near-infrared, and shortwave infrared ranges

# Hyperspectral imaging in intelligent farming

- Monitoring plant growth
- Assessing plant stress
- Evaluating soil composition
- Identifying invasive species



# Drones in Agriculture

Hyperspectral and multispectral imaging lenses are used in drones to capture and analyze detailed information about the environment or specific targets.

- Hyperspectral imaging lenses can:
  - Monitor crops
  - Detect changes in vegetation health, map land use
  - Identify mineral deposits

Drones can use multispectral imaging lenses to monitor crop temperature variations, detect soil moisture levels, and identify structural weaknesses in buildings and infrastructure.



# Imaging for Research

Drones with multispectral cameras can even bring efficiency to high-throughput plant phenotyping (HTPP), the physical expression of genes

- "Phenotyping bottleneck"
- Multispectral imaging is emerging as the best tool for breaking that bottleneck



# Additional Applications

Multi- and hyperspectral imaging are **excellent for research.**

Scientists can:

- Study the effects of climate change on crops and develop new and improved plant varieties
- Monitor and map land-use changes
- Use it for food safety purposes



# The Importance of the Lens for Multispectral and Hyperspectral Imaging

- Determines the spectral range
- Controls image quality
- Enables accurate spectral analysis

Other factors to consider for lens selection:

- Ensure the lens is designed to capture the specific wavelength range you're interested in
- Focal length
- Aperture

# Computar ViSWIR Series: See Past the Visible

Capture more precise  
& detailed info in  
different spectral  
bands



Better analysis &  
data interpretation



Increase Efficiency  
& Reduce Costs



Captured image by IMX990



No focus shift at any wavelength.

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# Other Recommendations (non-SWIR)

- MPT Series—45MP C-Mount series
- MPY—1.1" 12 MP, lightweight C-Mount, IR corrected series
- MPZ—1" 20MP compact, C-mount MP series



[computar.com/mvresources](https://www.computar.com/mvresources)



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# SOURCES

- [AG Funder News](#)
- [Computar.com](#)
- [Geopard](#)
- [Laser Focus World](#)
- [Nebraska Corn Board](#)
- [Photonics](#)
- [PLOS ONE](#)
- [Research Gate](#)

**THANK YOU!**

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