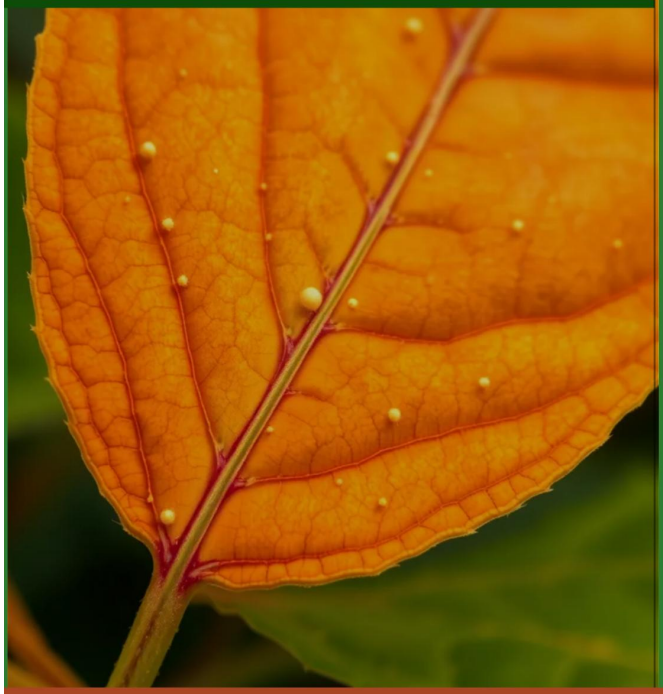
Hardware Platform Structure

The Online Agriculture Imaging Lab Kit is a calibrated multispectral imaging environment designed for controlled agricultural research, plant phenotyping, and spectral experimentation. The system integrates snapshot multispectral imaging and synchronized LED illumination.

Mechanical Lab Structure

Adjustable optical column stand configuration.
Rigid mounting for camera and illumination.
Stable imaging geometry for research consistency.
Optional linear stage or mini conveyor module available.



Imaging Hardware System

Multispectral Camera Head

- 4-band snapshot imaging at 580, 660, 735, and 820 nm.
- 512 × 512 pixels per band with 4 MP 1-inch CMOS sensor.
- 5.5 µm pixel size, global shutter, 10 FPS capture.
- Exposure range from 22 µs to 16.77 s.

Integrated LED Illumination

- 4 synchronized spectral channels matching camera bands.
- 8 high-power LEDs per wavelength.
- Pulsed operation for controlled acquisition.
- Designed for stable and repeatable illumination geometry.

Control & Power Unit

- Dedicated external control box for camera and LED Syncronization.
- Supports 18–75 V DC input.
- 110–240 V AC power option available.
- Typical power consumption approximately 60 W.

Optical Interface

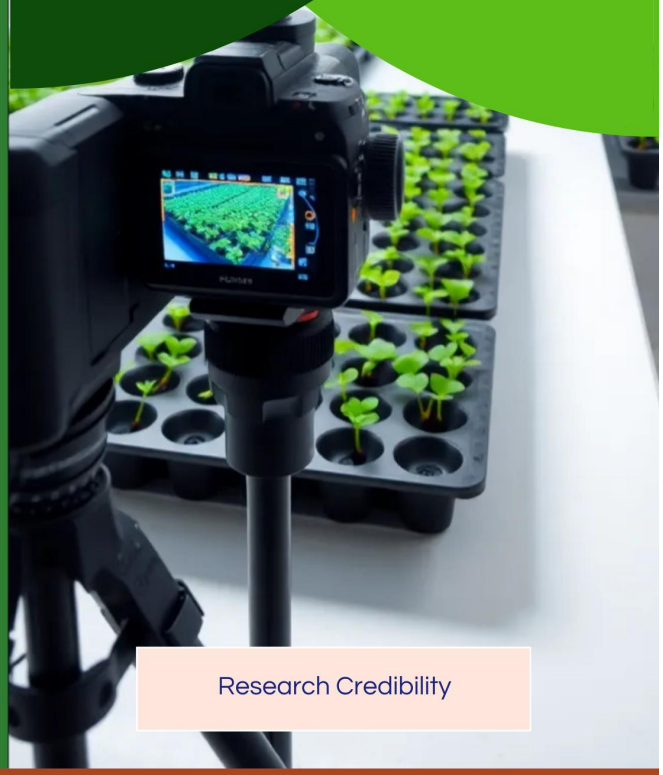
- Standard C-mount lens compatibility.
- Supports 8.5 mm to 50 mm focal lengths.
- Manual focus and iris with locking mechanism.

Calibration Support

- Reflectance reference tile included.
- Dark-frame correction workflow supported.
- Relative reflectance normalization capability.

ONLINE AGRICULTURE IMAGING LAB KIT

Calibrated Multispectral Research Platform for Agricultural & Plant Science Laboratories



Research Credibility

*Images are for illustration purposes only. Specifications are subjected to change

Open Research Data Workflow

The system is delivered as a calibrated hardware platform. Data processing icab=n be performed using third-party tools like MATLAB and Python or any third party software. No proprietary software lock-in.

Applications & Research Utility

The Online Agriculture Imaging Lab Kit is designed to capture image for plant phenotyping, chlorophyll estimation, nutrient deficiency analysis, water stress monitoring, and early disease detection under controlled laboratory conditions.

By enabling calibrated multispectral reflectance measurements, the system supports vegetation index development (NDVI, NDRE and custom indices), longitudinal crop studies, and spectral model validation.

For research laboratories, it provides repeatable imaging geometry, controlled illumination, and open data workflows, making it suitable for experimental studies, academic publications, and precision agriculture R&D validation.

Optional Automation Module

Motorized linear stage or mini conveyor with encoder-trigger synchronization. Enhances throughput and positional repeatability for batch capture.

System Integration & Support

Integrated and supported for academic institutions with system design assistance, installation guidance, and application consulting.

Environments Supported

MATLAB, Python, OpenCV

Windows platform

Analysis supported

NDVI / NDRE computation

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