



Southern Illinois University System

Applications

- Measuring plant canopy temperatures
- Multi-spectral reflectance
- Managing plan irrigation

Inventors

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Multi-Band Photodiode Sensor

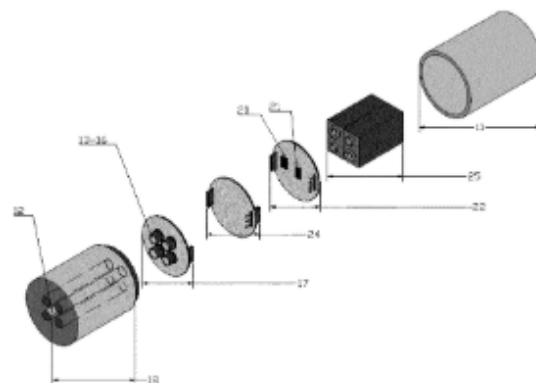
Multi-band radiometers are optical sensors, typically consisting of two or more photodiode detectors or charge coupled devices, which produce electrical current proportional to the light energy to which they are exposed. In agriculture, these sensors are typically used in the form of hand-held or vehicle-mounted instruments to remotely assess plant biophysical properties and generally require the user to be present in making the observations.

Invention

Researchers have developed a novel wireless multi-band sensor effective for measuring plant canopy temperature and multi-spectral reflectance, as well as a process to qualify the temperature data and classify the spectral reflectance measurements for use in irrigation management. The device is comprised of sensors for measuring radiation and spectral reflectance over five bands, a microprocessor to receive and store measured data from the sensors, a power supply and a wireless transmitter for transmitting data from the microprocessor to a remote receiver. The data is used to detect variations in spectral signature due to plant stress (e.g., disease, water stress) and soil background, and to qualify temperature data accordingly. The data provides information for decision support algorithms related to the initiation of automatic irrigation scheduling as a function of crop canopy cover, qualification of temperature data used in automatic irrigation scheduling algorithms, and detection of diseased crops for the purpose of withholding irrigations when yield potential is compromised.

Key Advantages

- Provides plant canopy temperature and spectral reflectance data
- Provides improved process for efficiently managing irrigation
- Integrated design contains sensors, microprocessor, wireless transmitter and electrical power supply



Status

U.S. patent #9,451,745 was issued September 27, 2016. The technology is available for license.

Other opportunities related to this technology, included but not limited to sponsored and/or collaborative research, may be available. Please reach out to the designated contact identified at left for more information.