

2. Light or solar radiation sensors



Figure 2. Photosynthetically active radiation (PAR) sensors (left) measure the light that is used by plants for photosynthesis. Pyranometers (right) measure shortwave radiation, which is the total incoming solar radiation (Photo courtesy of Decagon Devices).

Light is the driving force behind photosynthesis and can be used in plant growth models and/or coupled with water use models for irrigation management. Light can be measured in terms of shortwave radiation or photosynthetically active radiation (PAR). Shortwave radiation is the total energy of incoming light and is measured using pyranometers. PAR is light with wavelengths from 400 to 700 nm, which is the light that is used by plants for photosynthesis, and is measured using quantum sensors. Light sensors that measure in lumens, foot-candles, or lux measure how the human eye perceives light. Because our eyes perceive light differently than plants do, such sensors should not be used!

Shortwave radiation measurements can be used in evapotranspiration modeling, which can be used for irrigation scheduling. PAR measurements over the course of a day can be used to calculate the daily light integral (DLI) if frequent measurements (ideally once per minute or more often) are taken.

Calibration of light sensors drifts over time, and, therefore, they need to be recalibrated every 2-3 years. Ensuring that sensors are level and kept clean is important for accurate measurements. Many sensors come with a leveling plate to ensure a level installation.