

# SPECTRAL EVOLUTION

## Evaluating Different Light Sources on Plant Growth

If you are doing research on plant growth in a climate controlled chamber or a greenhouse type environment, you have a range of lighting sources available: LED, UV, High Pressure Sodium (HPS), etc. What will be the effect of the different lamps on plant growth?

To discover the answer for your environment and plants, you need to be able to measure the effect of different lighting sources and compare the results to outside sunlight measurements.

Photosynthetic response in plants correlates to a measure of the radiant power of the light source(s). This measurement is known as photosynthetically active radiation or PAR. PAR is defined by photons in flux—the number of moles of photons in the spectrum energy between 400 and 700nm. PAR is measured in moles/square meter/second.

The SR-1901 spectroradiometer from Spectral Evolution can be used to measure PAR. A typical configuration might include the spectroradiometer with a range from 280-1900nm, a fixed 1.2 meter fiber optic and a right angle diffuser that has been calibrated with a NIST traceable standard. The right angle diffuser is roughly 5x5x2 cm and has a 1 cm<sup>2</sup> detection area that measures incoming light over a 180° cone of detection. The right angle diffuser is calibrated for irradiance detection in W/cm<sup>2</sup>/nm. The SR-1901 collects high resolution scans of the light sources you wish to compare including sunlight.

The DARWin SP Data Acquisition software included with every Spectral Evolution instrument has pull down menus for more than 19 vegetation indices, including PAR. This feature recalculates the light output in micromole/m<sup>2</sup>/second. There is also an energy integration function that allows the SR-1901 to output the total integrated power from any selectable range between 280-1900nm.

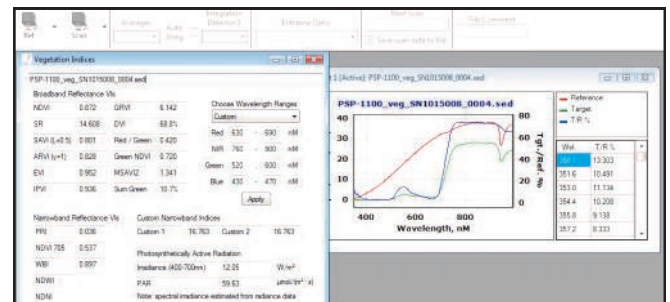
The SR-1901 features:

- ◆ Spectral range of 280-1900nm
- ◆ One 512-element UV-enhanced silicon array
- ◆ One 256 element TE-cooled extended InGaAs array
- ◆ No moving gratings or internal fiber optics
- ◆ Autoexposure and auto-dark shutter
- ◆ Compact, lightweight single box design
- ◆ Factory calibrated using NIST traceable source

For budget conscious applications, our SR-500 provides similar features for a 400-700nm spectral range with a single 512-element UV-enhanced silicon array detector.



*There are many different light sources available for indoor growth research, including LEDs.*



*DARWin SP Data Acquisition software included with the SR-1901 features 19 vegetation indices accessible from pull down menus. One of these calculates Photosynthetically Active Radiation (PAR) units.*

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