What is PAR

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Plants are photoautotrophs – using a narrow band of light between 400nm -700nm as a source of energy to make food molecules from carbon dioxide and water. This process is photosynthesis (the most important chemical process on Earth). The only type of light which enables photosynthesis is defined as Photosynthetically Active Radiation (PAR): the narrow band of light between 400nm – 700nm. Light outside of this range is not photosynthetically active and will not generate greater biomass for those seeking improved yield.

PAR or Photosynthetic Active Radiation needs to be measured. PAR is essentially a measurement of light emission within the photosynthetic range of 400-700nm. This represents the area of light that plants use for photosynthesis, or to grow. PAR is measured by the amount of micro moles of light per square meter per second. Although PAR is a key measurement, it only tells one part of the story. There are many areas within the PAR scale which plants absorb only in small quantities, such as in the green range (560 nm).

How to measure PAR

A spectrum reading is obtained by using a piece of equipment called a spectrometer. These two readings together will give a complete picture of a light's effectiveness; PAR showing strength, and spectrum showing that this strength is in the proper wavelength proportion for what the plant can actually utilize, and not just wasted energy. These two measurement tools produce a reading that shows not only what wavelength or color is being emitted, but also the absorption value of that particular wavelength. By looking at this graph, one can determine if the light is emitting the proper wavelengths used by the plant for photosynthesis and at the correct absorption peaks required for robust and quality plant growth. HID lights are a classic example for why considering both of these readings is so important. These traditional lights have decent PAR readings, but when their spectrum is revealed, it becomes evident that they emit most of their energy in the wrong areas, making them an inefficient lighting option.