



# Plants, Light, and LEDs: Putting It All Together

## Part 7 – Glossary and Reference



## Glossary

### Absorption Curve

A graph showing how well a plant pigment absorbs each different color of light.

### Absorption Peak

One or more points on an absorption curve showing maximum absorption a particular color of light.

### Alternative Power

Power generation from a source other than traditional gas/coal powered plants, nuclear plants, or hydroelectric plants. The most common types of alternative power generators available for home or small commercial use are wind and solar power.

### Chlorophyll

Any of a group of green pigments found in plants and other photosynthetic organisms.

### CO<sub>2</sub>

An odorless and colorless gas created during respiration in plants and animals, it is also absorbed by plants in photosynthesis.

### Coconut Coir

The coarse fiber obtained from the husk of a coconut, which has found a new purpose as a growing medium in hydroponic growing systems.

### Container Growing System

A plant growing system in which plants are grown in individual container, either inside or outside of a greenhouse. Commonly used in commercial growing of plants for resale.

## Crop Shading

As used here, the unintentional blocking of sunlight entering a greenhouse which leaves part of the growing area in shadow.

## Electromagnetic Radiation

Radiation consisting of electromagnetic waves, including radio waves, infrared, visible light, ultraviolet, x-rays, and gamma rays.

## Environmental Control Systems

Greenhouse equipment used to control various aspects of the environment in a greenhouse. These typically control air temperature, humidity, air mixing, CO<sub>2</sub> levels, and supplemental lighting.

## Fluorescent Lamp

A gas-discharge lamp that uses electricity to excite mercury vapor in argon gas, creating a plasma that produces ultra-violet light. This light causes a phosphor coating on the glass tube to fluoresce, producing visible light.

## Greenhouse

A structure, typically of glass or plastic, in which the environment can be controlled for the cultivation or protection of plants.

## Growing Medium

Any material used to support the root structure of growing plants. Although originally this referred to soil, modern growing mediums avoid using soil to reduce or eliminate pathogens commonly found in soil. Typical growing medium components are sand, peat moss, vermiculite, perlite, rock wool, and coconut coir.

## Growing System

In the context of this document, a growing system is any set of methods and procedures used to grow and maintain the health of plants. While all growing systems have their place, not all growing systems work equally well in all circumstances. For example, some growing systems developed to be used in a greenhouse will not work the same way outdoors.

## Heat Load

The amount of excess heat which must be eliminated by the cooling system of a greenhouse. Heat load comes from a number of sources, including heating from sunlight entering the greenhouse, the heat generated by greenhouse equipment, and the waste heat generated by supplemental lighting systems.

## High Pressure Sodium

See sodium vapor lamp.

## HPS

See sodium vapor lamp.

## Hydroponics

Cultivation of plants in a nutrient solution or nutrient mist rather than in a growing medium or soil.

## Just-In-Time Production

Called *kanban* in Japan where it was developed, this is a method of inventory control that keeps inventories low by scheduling parts and supplies to arrive at the factory a short time before a production run begins.

## LED

An acronym for light-emitting diodes, semiconductor diodes that emit light when conducting current. LEDs are commonly used in electronic displays, water sanitation devices, and various types of lamps, including plant growing lamps.

## Light-Emitting Diode

See LED.

## Light Spectrum

The range of colors which can be detected by the human eye in visible light, which falls between infrared and ultraviolet electromagnetic radiation.

## Metal Halide Lamp

A member of the high-intensity discharge (HID) family of lamps, originally created in the late 1960's as industrial lighting. Metal halide lamps operate under high pressure and temperature and require special fixtures to operate safely.

## Monochromatic Light

Theoretically this refers to light consisting of a single wavelength, but this is never seen in nature. In practice this refers to very light of a very narrow bandwidth, such as laser light. The light from LEDs also has a relatively narrow bandwidth.

## NFT

See nutrient film technique.

## Nutrient Film Technique

One of the most commonly used hydroponic growing systems, in which a constant flow of nutrient solution is pumped from a tank to flow down a sloped tube or tray over the roots of the plants, before returning to the tank.

## PAR

An acronym for Photosynthetically Active Radiation, which refers to the spectral range of solar light that is used by plants in photosynthesis. This range of light also corresponds to the range of light visible to the human eye.

## Peat Moss

The partly carbonized remains of any of various mosses of the genus Sphagnum growing in very wet places, which are commonly used in growing mediums for plants.

## Perlite

A type of volcanic glass that expands and becomes porous when heated. Used in growing mediums to lighten the medium, it also increase the amount of air and water it can hold.

## Photodiode

A photodiode is a type of photodetector capable of converting light into either current or voltage, depending upon the mode of operation. They are commonly used as sensors in photometers.

## Photometer

An instrument for measuring a property of light, especially luminous intensity or flux.

## Photon

The quantum of electromagnetic energy, regarded as a discrete particle having zero mass, no electric charge, and an indefinitely long lifetime.

## Photoresistor

A resistor whose resistance varies as a function of the intensity of the light it is exposed to. Also called a photocell.

## Photosynthesis

The process in green plants by which carbohydrates are synthesized from carbon dioxide and water using light as an energy source, and in which oxygen is released as a byproduct.

## Photosynthetically Active Radiation

See PAR

## Pigment

A chemical substance, such as chlorophyll, that absorbs light. Each pigment has a characteristic absorption curve and distinctive absorption peaks, which show how well the pigment absorbs each color of light.

## Plant Physiology

A sub-discipline of botany concerned with the function, or physiology, of plants.

## Prism

A transparent solid body, often having triangular bases, used for dispersing light into a spectrum.

## Rock Wool

An inorganic fibrous substance produced by steam blasting and cooling molten glass or a similar substance. Long used as insulation, rock wool is also used as a plant growing medium.

## Sodium Vapor Lamp

A gas discharge lamp which uses sodium in an excited state to produce light. There are two varieties of sodium vapor lamp, high pressure and low pressure.

## Spectroradiometer

An instrument for determining the radiant-energy distribution in a spectrum, typically used by lighting manufacturers to determine the spectral characteristics of a lamp.

## Supplemental Lighting

Man-made light generators added to a greenhouse to supplement the natural sunlight received. The two main purposes of supplemental lighting are to increase the amount of light during times of diminished sunlight, as in winter or on cloudy days, and to increase day-length for plants with a long photoperiod.

## Vermiculite

Any of a group of platy minerals, hydrous silicates of aluminum, magnesium, and iron, that expand when heated. In the expanded state vermiculite is used as a plant growing medium.

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