

Lumens and Grow Lights

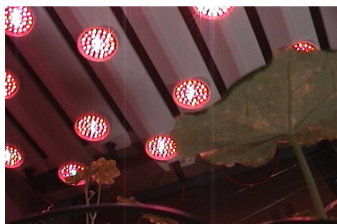
Lumens and Lux, by definition, are used to measure how bright a light source appears to the human eye- or what we perceive as bright. Although it has become common-place for grow light manufacturers to rate their grow light output in Lumens, they are only telling you how bright their light will appear to you and light your room, not how well it will grow your plants. Since the human eye is most sensitive to colors plants don't need, and least sensitive to colors plants prefer, Lumens can't be used to accurately compare the plant growing capability of grow lights.

Light comes in many colors, or wavelengths. To the human eye, the colors green and yellow appear much brighter than the colors red and blue which are the primary colors used by plants for photosynthesis. HID, incandescent, and fluorescent lighting were all originally designed to light rooms. The manufacturers took these bulbs and added bits of impurities to get more of the colors that plants need and labeled them "grow lights". As much as 82% of the light coming out of these traditional light sources is not absorbed by plants or is in the form of UV, or IR (heat). HID lighting can reach temperatures of over fourteen hundred degrees Fahrenheit at the bulbs surface. This excess heat is then ventilated and directly translates into wasted energy that is included in a lumen rating.

In 2002, the engineers at Solar Oasis introduced the world's first patented LED grow light. LEDs offered a unique opportunity to the designers. Instead of starting with an existing lamp designed to light rooms for people- the LED grow lamp designer can select LEDs that generate exactly the colors of light needed to target wavelengths that are needed for plant growth. Designers are able to add as many colors as they would like and add them in their proper proportion. Finally, the individual LEDs can be arranged in whatever pattern desired to create the final lamp design. By leaving out colors of light that are useful for human vision but not useful for plant growth, incredible levels of efficiency are attained in comparison to other types of grow lights. With this modern lighting- comes modern measurement.

A typical grow light produces light wavelengths from 380nm (UV), up to and beyond 880nm (IR). Plants use light wavelengths from 400nm (blue) to 700nm (red). The most accurate unit of measurement for comparing grow lights is the micro Einstein, which measures how many photons of light strike an area per second. Using the microEinstein we are able to measure how much useable light is emitted (aka wavelengths that fall between 400-700nm). But, while this is a much better way to estimate a lamp's plant growing ability than Lumens or Lux, it is still very difficult to directly compare two different types of grow lights. All grow lights except the LED Grow Master grow light emit large amounts of light plants don't use very efficiently, so including that light output in a light's plant growing measurement is misleading.

To those of you that feel like this is all Greek, an analogy... What is now called an inch was originally the width of a man's thumb. The word carat comes from the weight standard for precious metals of the olden days- the carob bean. We promise not to send you bar measurements in thumb widths, or the weight in carob bean. Along these same lines, we do not measure our output in lumens. We understand the need for, and beauty, of accurate measurement.



Human View



Plant View