

## THE TRUTH ABOUT LED GROW LIGHTS

### 1. Why there is so much controversy about LED grow lights working.

Some people say LED grow lights work great for growing marijuana, while others claim LED grow lights are sub-par and cannot be used to grow any plants at all.

The truth is if one uses the proper LEDs at the proper time line at the proper stage LED's will be your best choice for growing marijuana.

Let's discuss LEDs as grow lights made of **light emitting diodes**, commonly known as LEDs. You may have seen ads for these lights, which often resemble UFOs, and claim to be the growing technology of the future.

First invented in 1927, no one could find any practical use for these tiny lights until 1962, when LEDs were first introduced as glowing red indicators on electronics. After that, LED development has proceeded rapidly. LEDs, which were originally tiny and dim, have **doubled in efficiency and light output about once every 36 months** since the 1960s.

As you probably know, people have tried growing plants with just about every type of artificial light we have ever created, and LEDs are no exception. This has all led to the development of **LED grow lights**. At first, no one could successfully grow any plant life using LEDs. Each individual LED is relatively small and produces only a specific wavelength (color) of light, and we could not seem to successfully replicate the proper strength and color of sunlight. But through research, trial and error we have now developed some viciously effective LED grow lights.

#### LED grow light systems now have some appealing benefits:

- Extremely efficient and uses a fraction of the electricity of other grow lights
- Today's LED light systems run extremely cool and does not require growers to control heat
- Most LED light systems can be plugged directly into a regular power outlet, and do not need a ballast or special light socket like most other grow lights.
- Some growers claim that marijuana buds grown under LEDs contain more THC and other cannabinoids (which may be because marijuana produces stronger buds when slightly stressed)

Now, it's a proven fact that LEDs can be used to grow plants from the beginning to the end of their life cycle.

### 2. I am currently using 2000K HPS and it works fine, should the LED grow light be at the same color 2000K and lumens?

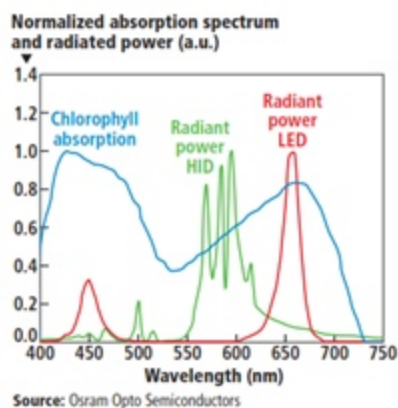


FIG. 2. LEDs can be chosen to match chlorophyll absorption peaks.

HPS lamps have a broad spectrum output range, as shown in figure (FIG 2.), where the majority of the light is within 500-620nm, which is yellow range. The yellow spectrum gives HPS 2000K color temperature and accounts for the majority of lumens. However, the plants do not need yellow light in either the **vegetation** or **flowering** stage. With LED technologies, we can select the wavelength which marijuana can absorb and use, and avoid the useless yellow spectrum. Therefore, the correct color for LED grow lamp should be purple (combination of blue and red) instead of yellow tint at 2000K. Without wasted lumens, a 400 watt LED grow lamp can replace 1000 HPS. Therefore, LED grow lamps do not need to match HPS in color temperature and lumens!

## THE BENEFITS OF USING RAPTOR LIGHTING® LED GROW LIGHTS

- LED grow lights have a long life span with +35,000 life-time hours
- Customized wattage and light pattern available to provide the optimal light spectrum for marijuana
- Optional red & blue channel intensity control

### LED GROW LIGHTS AND MARIJUANA

Yes LED's are a great light source and are proven to grow marijuana. A 90 watt LED light system has the same output power as a 400 watt HPS or MH lamp

- Using LED's for growing saves around 83% from your energy bill vs. HPS and Metal Halide lamps. This is a green solution which is better for the environment, and also your power bill
- Low Heat. How many times did you forget to raise your HPS lamp and burn the tops of your plants? LED grow lamps emit very little heat. This also means your grow room won't be as hot, so it is easier to control the temperature. Your thermal footprint will also be less, providing a more discreet growing experience.
- The LED's provide the right blend of light to be equally effective during the vegetative and budding stage.

### THE FLOWERING STAGE:

Once your plants have reached 20" inches or so and look strong and green (well nourished), it is then time to change your lamps to 12 hours ON and 12 hours OFF. This makes your plant think that autumn has arrived and that it is time to begin flowering stage (budding).

Remember only to do any growing while the lights are on; lights that are on in the middle of their night-time periods are not good for the plants. The care you have to provide is much the same as with the vegetative stage. Control any

insects and keep your plants nourished. Pay attention to their needs. You might want to trim some of the larger leaves to allow the lamps to penetrate to the lower levels, but this is not absolutely necessary.

As soon as you notice the plants showing signs of their sex, you will want to remove the males. If both sexes are allowed to grow to maturity, the males will pollinate the females and your weed will not be sinsemilla.

The biggest change from the vegetative stage is the lighting. We want to increase the amount of red-spectrum lighting and we want more light in general. The old way is using HPS or fluorescent tubes to provide side lighting for your tall plants – which is by 6,500K CFL's with 2,700K CFL's. The 6500K CFL is rich in blue light, while 2700K CFL is rich in red, which is need for budding. The LED grow light will be flushed with 660nm red color which is exactly what the budding needs, and the lamps will be on for less time. The perfect flowering light cycle is 12 hours on, 12 hours off.

Keep the same dawn time you used for the vegetative stage to reduce stress on the plants. This lighting cycle will let the plants know autumn has come, and for the Cannabis plant, autumn is the season of adore.

Keep your watering the same. If you were using nutrients for vegetation (nitrogen-rich), stop them as the plants will need more phosphorous than nitrogen at this stage. Grow supply stores sell great nutrients for flowering. Almost anything with the word bloom in the name will work, but ask the sales staff for advice if you're uncertain. Nutrients will usually be mixed in the water at watering stage. Just like before, only water the plants when the top of the dirt has become dry and crusty. The plants are still very susceptible to over-watering.