



The Evolution of the Grow Light

[Heliospectra, provider of energy-efficient, fully controllable LED grow lights for greenhouses, indoor growers and researchers](#)

Horticulturists have used grow lights for more than a century. While the most cost-efficient grow light is the sun, this isn't always the best option. Whether plants are being temporarily housed indoors for the winter or being cultivated entirely inside, grow lights are often necessary. Just as there have been technological developments in residential lighting, there have been advances in horticultural lighting, from the use of carbon arcs in the 1880s and fluorescent lamps in the 1930s to high-pressure sodium lamps (HPS) in the 1950s and light-emitting diodes (LEDs) from the 1990s to today.

When [Shuji Nakamura](#) invented blue LED in 1994, allowing for the creation of white light, the use of LEDs developed significance with scientists, but not yet with consumers. This changed in [1999](#), when Dr. Roland Haitz, a pioneer in LED lighting explained, "This new white light source would change the way we live, and the way we consume energy." Following his [presentation](#), LED-based ventures were infused with federal and private investments. Since then, research has rapidly progressed to the point of LEDs surpassing its competitors and becoming a legitimate option for scientists, consumers and commercial growers. However, even with these advances, it can still be difficult to shake

off old [myths](#), especially when it comes to LED grow lights.

Although there are many [options](#) available, indoor and greenhouse growers often find themselves facing a choice between High Intensity Discharge (HID) and LED. HID grow lights are divided into HPS and Metal Halide (MH). HID grow lights are associated with greater power and lower cost but have little flexibility forcing growers to make unnecessary compromises in their operation. HPSs most often have a high amount of red and yellow/orange light, but lack blue light. This may cause longer and skinnier plants than normal. On the other hand, MH grow lights provide higher amounts of blue light, which is even more readily absorbed by plants than red. But it still isn't recommended to grow certain plants entirely under HPS or MH as this denies the plants part of the light spectrum they need to truly thrive. As the areas of the spectrum that drive photosynthesis are highest in the red end (600-700 nm), followed by the blue region (400-500 nm) and lastly, the green region (500-600 nm), all of which are needed for a healthy plant.

Growers are left with a choice - choose either HPS or MH and sacrifice quality and yields, or move their plants during the growth cycle. The flexibility of LEDs means a single light fixture can be controlled to deliver the right color at the right time, reducing the need to choose a sub-optimal light or move plants to meet the needs of different plants at different growth stages.

Early LED grow lights did lack the power to compete with HID; however, just as traditional light bulbs are now being replaced by LEDs in our homes, modern LED grow lights replace HIDs in commercial grow operations. LEDs can now more efficiently achieve the same yield as an equivalent HID light at a lower cost.

LEDs may require higher initial investment, but higher quality and longer lifespan often requires a higher initial investment. Growers also know that a higher yield means higher revenues. A good LED grow light may have a higher sticker price than an equivalent HID grow light, but the LED light makes up for it in greater yield and energy savings. When a grower shifts to the LED lamp, they reduce their energy consumption by [30-50 percent](#), and helps lower the overall HVAC costs.

We understand that for commercial growers, reducing cost isn't only about the cost to purchase a piece of equipment but also the cost of maintaining the equipment. All of Heliospectra's LED grow lights can be expected to provide at least [50,000 hours](#) of light and require very little maintenance during operation. An LED light also experiences less depreciation in light output, meaning that it will stay brighter during those 50,000 hours than HIDs.

Taking it one step further, LED grow lights have evolved and joined the Internet of Things concept. With [the right lamp](#), growers are given full control to configure their lights through their phone, tablet or computer - at any time, anywhere in the world. The computer control systems also allow for light recipe creation and greater data collection as part of the overall grow operation.

The next step? Heliospectra is working on ground-breaking new features for the grow light industry, developing sensors that will listen to the plants and automatically adjust the light output after their need.

Admittedly, there are still some less effective LED lights on the market, but this doesn't mean that LED technology as a whole hasn't improved or that LED cannot produce the same—or better—results than HID. Research proves that LED has caught up to HID; growers should be careful and do their due diligence before purchasing. With the right technology provider, LED is now the best choice for indoor and greenhouse growers.

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