



HORTICULTURE ARTICLE

How Far Do LED Lights Penetrate the Canopy?

Written by
Kelly Hansen



We are often asked how far into the canopy our LED grow lights deliver light. Cannabis growers, in particular, are concerned with delivering light to the flowers under a dense canopy, because cannabis flowers best under direct light. Oftentimes, growers see nicely developed, dense buds at the top of the canopy, while buds from the underside of the canopy are less dense and not as well developed.

Many factors are at play when determining how much light penetrates the canopy. Plant species, leaf thickness, leaf size and the number of leaves within a given area all play a part in light penetration, and so it's impossible to make a blanket statement.

What we can say, however, is this: the quality of light Illumitex LED grow lights deliver to the plant encourages increased leaf accumulation to intercept more light and increase production further. The leaves of a plant are essential for capturing light energy that is crucial for plant growth (photosynthesis). What inevitably happens is that the top of the canopy flourishes with new leaf growth while the older leaves at the bottom of the plant slowly age and the sugars and nutrients from those leaves are diverted to actively growing regions of the plant. Eventually,



HORTICULTURE ARTICLE

Additional fixtures can be used as side lighting

older leaves senesce as the new accumulation of plant matter thrives at the top of the canopy where the most light is captured.

For the most part, we give LED lighting recommendations for overhead placement of fixtures. For growers interested in providing more light to the plant matter under the canopy in order to increase yield potential, we suggest utilizing additional fixtures to provide side lighting. Having some distance between the fixture and the sides of the plants will allow our optics to deliver an even spread of intensity (less likely to have “hot spots” of intensity along the sides of the plants). Just like overhead fixture placement, be cautious when mounting closer than 12” to the plants due to our LED array placement as well as our intense delivery power.

We can illustrate this concept with data obtained from our in-house laboratory. Under a NeoSol DS, the PPFD at the plant canopy is 590 $\mu\text{mol}/\text{m}^2/\text{s}$. This is at the top of the canopy, so we can assume that the leaves are capturing that energy. When placing the sensor at the base of the plants, the PPFD was less than 12 $\mu\text{mol}/\text{m}^2/\text{s}$. This isn't to say that the light does not penetrate the leaves well, but rather that the density of the canopy is substantial enough to cause almost all light energy to be captured by the leaves. Plants are always redistributing resources to actively growing and developing regions including flowers and fruits.

If you are interested in providing additional lighting to the under canopy of your plants, consider obtaining Eclipse Series fixtures. These are 4' fixtures that can be placed at container level and directed to shine the underside of the canopy. They are dimmable, meaning you can adjust the intensity that is reaching the inter-canopy area. Surexi Horticultural LED packages, featured in the Eclipse Series, allow you to choose a spectrum tailored to your application.