

## Supplementary Material

Alsanius, B.W.\*, Hellström, M., Bergstrand, K.-J., Vetukuri, R.R., Becher, P. G., Karlsson. M.E. The power of light from a non-phototrophic perspective: A phyllosphere dilemma. Front. Photobiol. - Photoecology and Environmental Photobiology, 2. DOI: 10.3389/fphbi.2024.1432066

### Supplementary Material S1. Exposure dose example

The exposure dose of an LED set at 660 nm at a light intensity of 500 $\mu\text{mol m}^{-2} \text{s}^{-1}$ vs and LED set at 400 nm at a light intensity of 500 $\mu\text{mol m}^{-2} \text{s}^{-1}$ :
<b>Energy of one photon</b>
$E = \frac{hc}{\lambda}$ <p><math>E</math> is the energy of the photon in joules</p> <p><math>h</math> is Planck's constant (approx. <math>6.62607015 \times 10^{-34} \text{ m}^2 \text{ kg s}^{-1}</math>)</p> <p><math>c</math> is the speed of light (approx. <math>299792458 \text{ m s}^{-1}</math>) in a vacuum</p> <p><math>\lambda</math> is the wavelength of the light in meters</p>
<p>Energy (J) of one photon of 660 nm:</p> $E_{660} = \frac{6.62607015 \times 10^{-34} \times 299792458}{6.6 \times 10^{-7}}$ $E_{660} = 3.01 \times 10^{-7} \text{ J}$
<p>Energy (J) of one photon of 400 nm:</p> $E_{400} = 4.97 \times 10^{-7} \text{ J}$
<b>Light intensity</b>
<p>Intensity (I) = 500 <math>\mu\text{mol m}^{-2} \text{s}^{-1}</math></p> <p>Area (A) = 1 <math>\text{m}^2</math> (assuming light is falling on a square meter area)</p> <p>Convert intensity to photons per second:</p> $\text{Photons s}^{-1} = I \times A$ $\text{Photons s}^{-1} = 500 \times 10^{-6} \times 1$

Photons $s^{-1} = 5 \times 10^{-4}$
<b>Total energy output</b>
<p>Total energy output = Photons <math>s^{-1} \times E_{\text{photon}}</math></p> <p>Total energy output (<math>J m^{-2} s^{-1}</math>):</p> <ul style="list-style-type: none"> <li>- For a 660 nm lamp at <math>500 \mu mol m^{-2} s^{-1} = 1.50 \times 10^{-22}</math></li> <li>- For a 400 nm lamp at <math>500 \mu mol m^{-2} s^{-1} = 2.48 \times 10^{-22}</math></li> </ul>
<b>If the LEDs are switched on for 24 hours, the total exposure dose would be:</b>
<p><i>For a 660 nm lamp at <math>500 \mu mol m^{-2} s^{-1}</math></i></p> <ul style="list-style-type: none"> <li>• <math>= 1.50 \times 10^{-22} \times (24 \times 3600 \text{ s})</math></li> <li>• <math>= 1.3 \times 10^{-17} J m^{-2}</math></li> </ul>
<p><i>For a 400 nm lamp at <math>500 \mu mol m^{-2} s^{-1}</math></i></p> <ul style="list-style-type: none"> <li>• <math>= 2.48 \times 10^{-22} \times (24 \times 3600 \text{ s})</math></li> <li>• <math>= 2.15 \times 10^{-17} J m^{-2}</math></li> </ul>
<b><i>The total exposure dose is approximate 44% lower for the 660 nm LED than for the 400 nm device.</i></b>