

OSRAM

Growking Horticultural system estimation

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Light is **OSRAM**

System Setup for Illumination

Given information

Requirements and Boundary Conditions:

Photonic flux on surface: to be evaluated,

Distance to plant: 15cm, 30cm, 40cm, 50cm

Illuminated surface to be used for calculations: **50cm x 50cm**

Luminous Flux of one luminaire: 6817 lm

Photosynthetic Photon Flux (400nm – 700nm) of one luminaire: 203 $\mu\text{mol/s}$

Amount of luminaires used in setup: 3

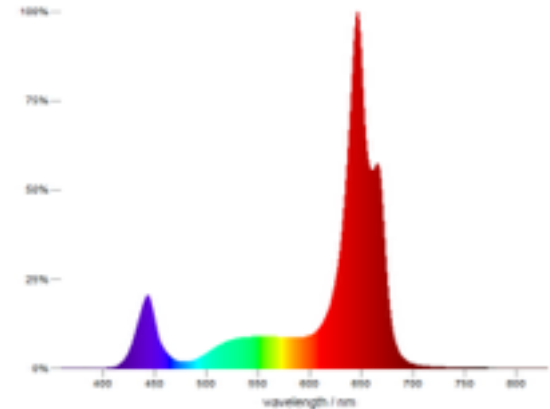
Total Luminous Flux: 20451 lm

Total Photosynthetic Photon Flux (400nm – 700nm): 609 $\mu\text{mol/s}$

Only the light from the LED considered for simulation, no light from the sun!

Environment influence was not taken into account (maintenance factor = 1)

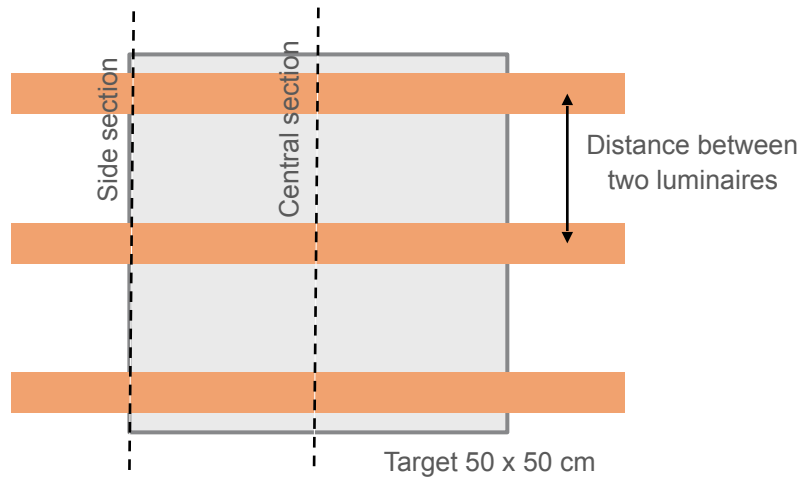
Determine distance between 3 luminaires for the best homogeneity



System calculation

Homogeneity

Photosynthetic Photon Flux (per luminaire): **203** $\mu\text{mol/s}$

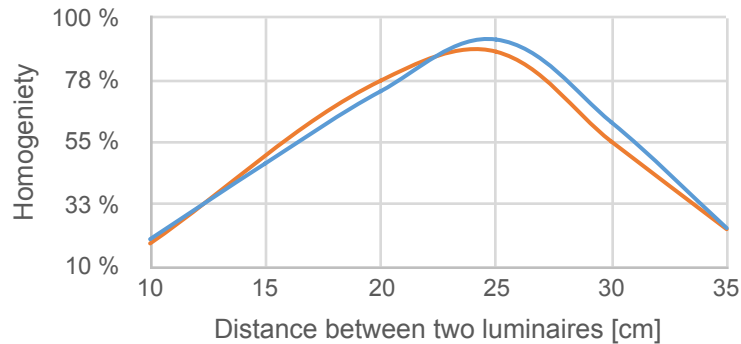


Homogeneity value = min / max along the section

System calculation

Homogeneity

Distance to plant: **15 cm**



E_{av} [x]
1082

E_{max} [x]
970

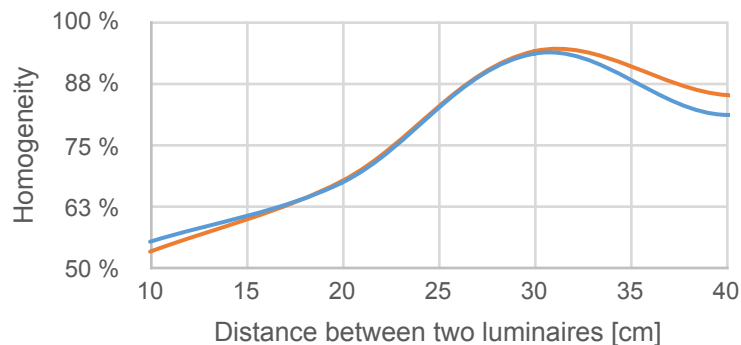
E_{max} [x]
1192

Result for distance between two luminaires 25 cm:

— Side section
— Central section

- Average **1082** $\mu\text{mol/s/m}^2$
- Maximal **1192** $\mu\text{mol/s/m}^2$
- Minimal **970** $\mu\text{mol/s/m}^2$

Distance to plant: **30 cm**



E_{av} [x]
804

E_{max} [x]
655

E_{max} [x]
894

Result for distance between two luminaires 30 cm:

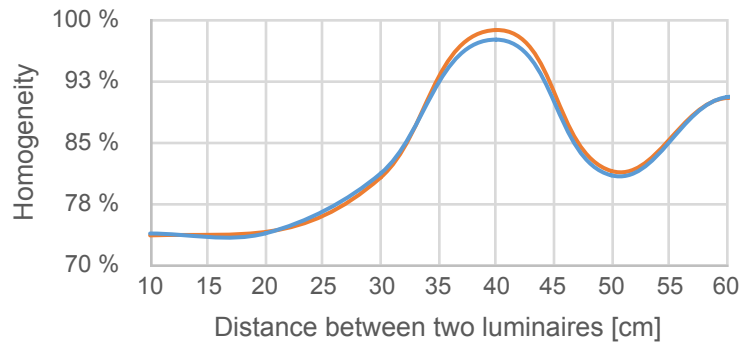
— Side section
— Central section

- Average **804** $\mu\text{mol/s/m}^2$
- Maximal **894** $\mu\text{mol/s/m}^2$
- Minimal **655** $\mu\text{mol/s/m}^2$

System calculation

Homogeneity

Distance to plant: **40 cm**



E_{av} [μ]

553

E_{min} [μ]

470

E_{max} [μ]

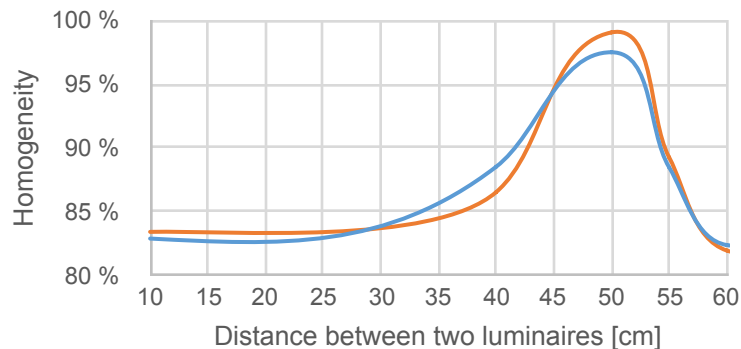
607

Result for distance between two luminaires 40 cm:

— Side section
— Central section

- Average **553** $\mu\text{mol/s/m}^2$
- Maximal **607** $\mu\text{mol/s/m}^2$
- Minimal **470** $\mu\text{mol/s/m}^2$

Distance to plant: **50 cm**



E_{av} [μ]

397

E_{min} [μ]

351

E_{max} [μ]

423

Result for distance between two luminaires 50 cm:

— Side section
— Central section

- Average **397** $\mu\text{mol/s/m}^2$
- Maximal **423** $\mu\text{mol/s/m}^2$
- Minimal **351** $\mu\text{mol/s/m}^2$

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Thank you.