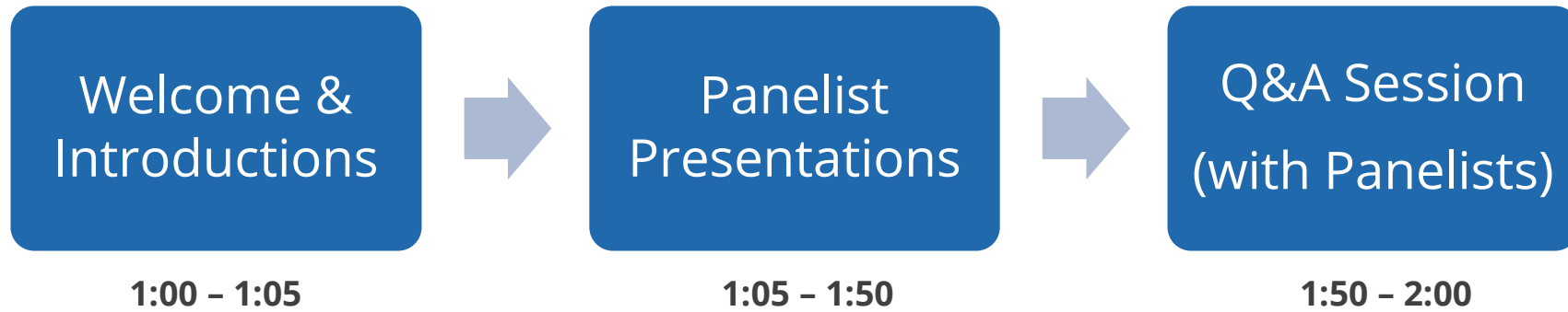




September 8, 2021
DesignLights Consortium

Agenda



Let us know
your questions
in the chat

Mythbusting Reminder!

Today's panel will lay out and break down common misconceptions and concerns for utilizing LEDs among growers

If you don't hear your questions or concerns being brought up, **let us know** in the chat!

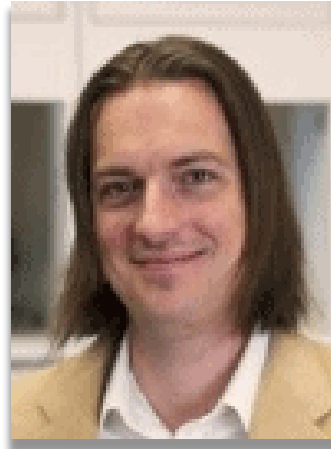
The Moderator



Kasey Holland

Technical Manager
DesignLights Consortium

The Panel



John Wilson

Founding Director
Fernhill Shopworks



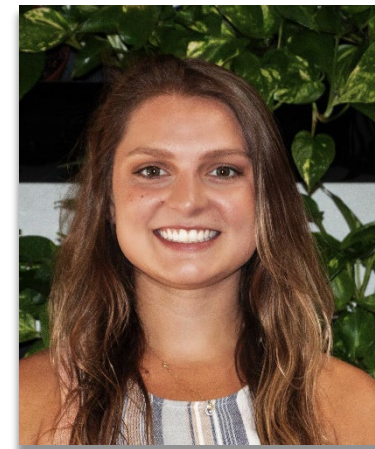
Leora Radetsky

Senior Lighting Scientist
DesignLights Consortium



Erico Mattos

Executive Director
Greenhouse Lighting and
System Engineering
consortium (GLASE)



Lauren Morlino

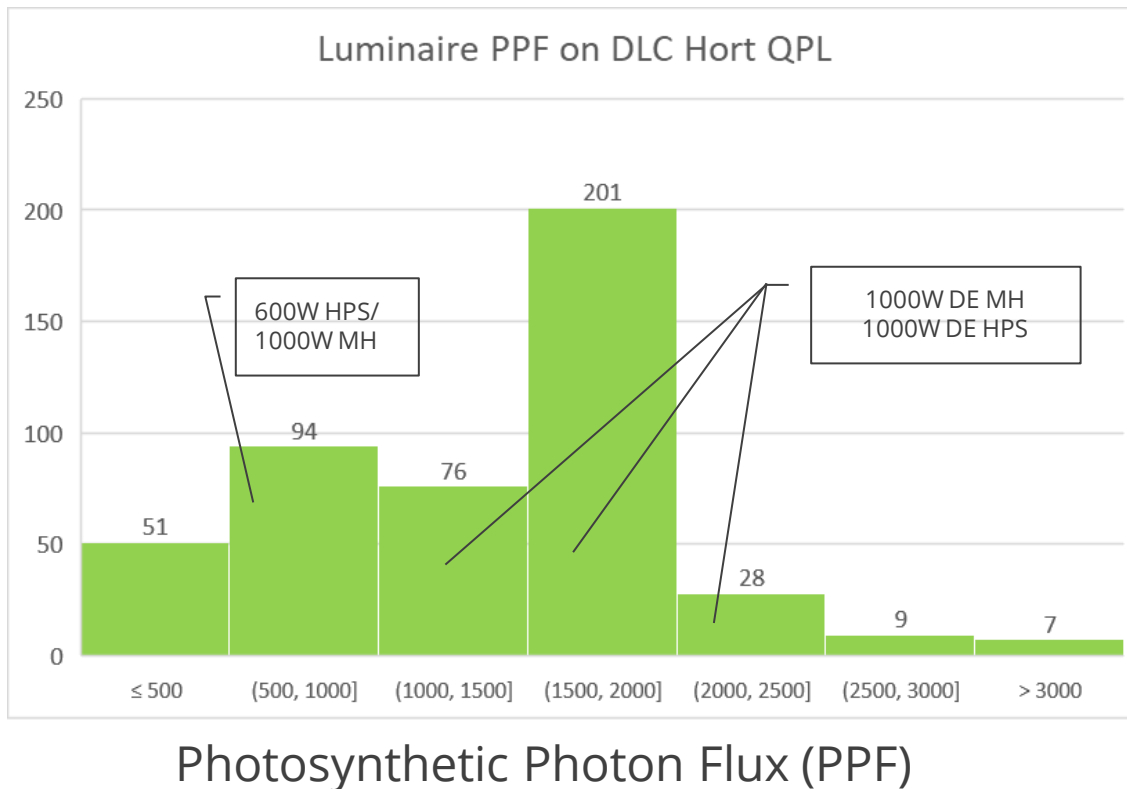
Technical Manager
Evergreen Consulting
Group



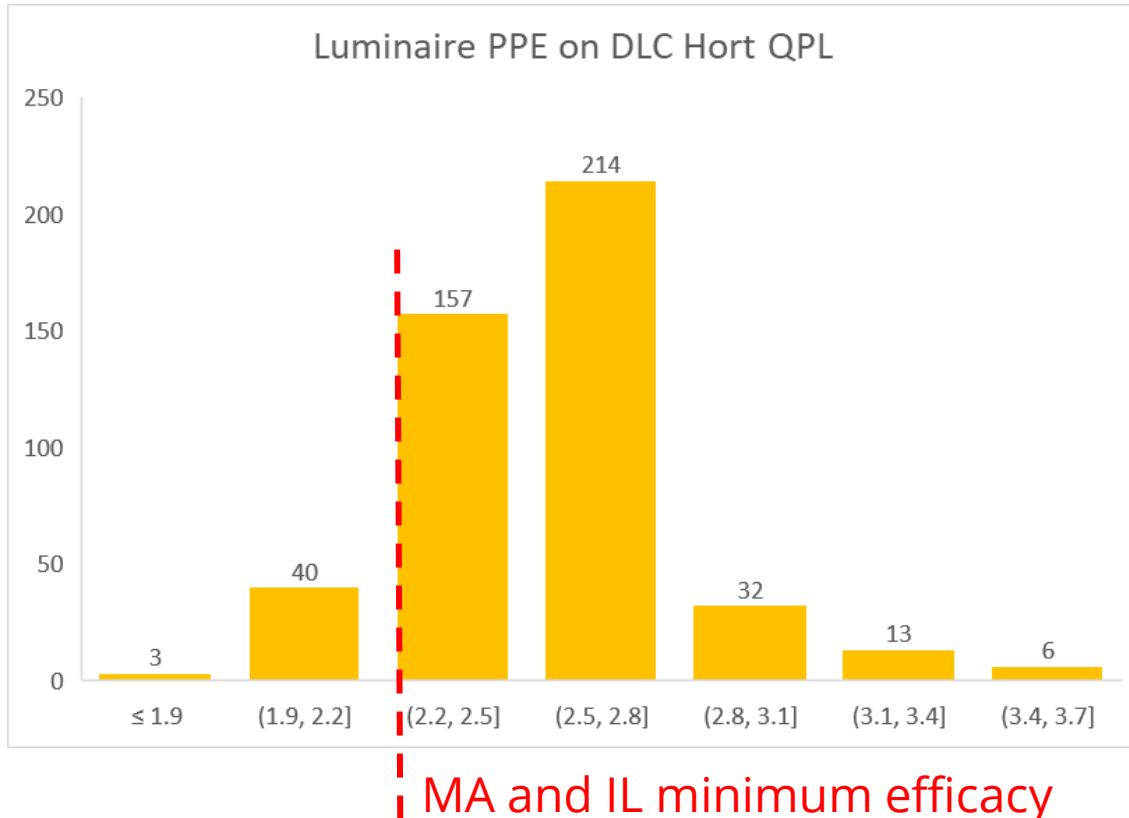
Myth 1: LED lights can't compare to my current lights (e.g. 1000W DE HPS).

Does LED lighting have what it takes to replace my current light source?

- Over 470 LED fixtures as of Sept 3
- Use PPF not lumens to compare
- Many LED fixtures have equivalent PPF to HID luminaires



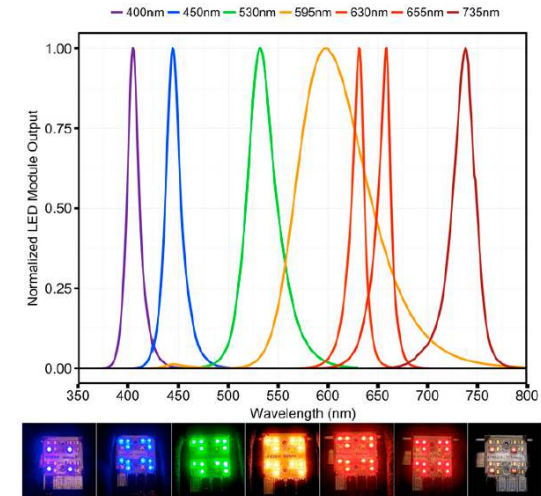
Does LED lighting have what it takes to replace my current light source?



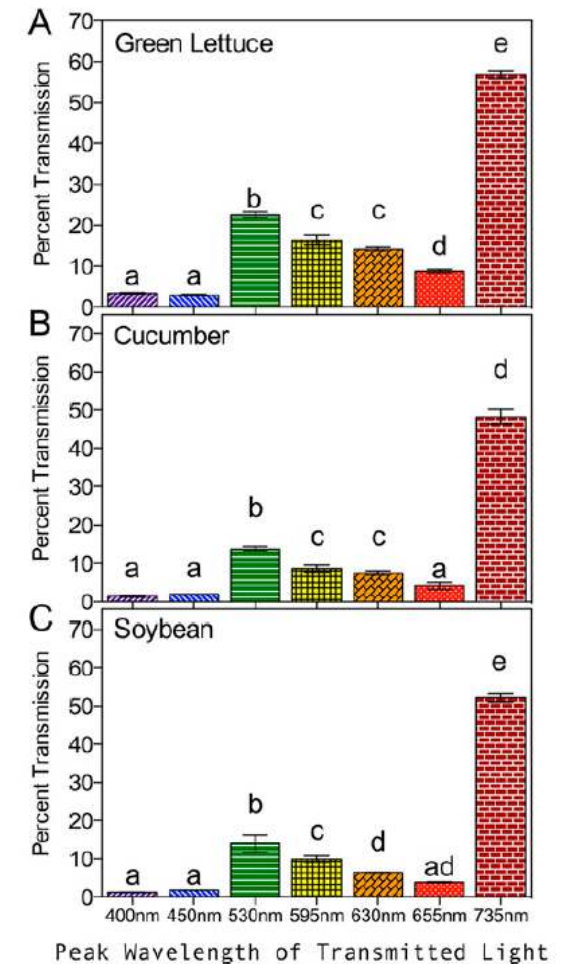
- Many LED fixtures will save energy compared to HPS or MH fixtures and provide the same (or higher) PPFD
- Some regulatory agencies and energy efficiency programs use minimum PPE requirements that encourage LED use

Can LED lighting penetrate the canopy?

- Yes, but depends on the light spectrum, plant type and canopy architecture
- Deeper/thicker canopy reduces PPFD and changes spectrum (Red-to-far-red ratio decreases; green penetrates better than red or blue).
- Need to measure spectrum above and in the canopy (including far-red) to understand impact
- May want to use inter-lighting LED luminaires to increase PPFD inside the canopy



225 and 420 $\mu\text{mol m}^{-2} \text{s}^{-1}$



<https://doi.org/10.21273/HORTSCI.50.3.501>

Is it true that manufacturing an LED chip board is worse for the environment than manufacturing replacement bulbs?

- Need to compare material info and/or life cycle costs to know
- Carbon costs: operational carbon and embodied carbon
 - LEDs reduce operational carbon, but what about embodied carbon?
 - Material transparency labels are not readily available for lighting
- Hazardous substances
 - ROHS compliant products may be the easiest to find.
- Ask the lighting manufacturer
 - Material transparency labels or ROHS compliance
 - Easily serviceable
 - End of life programs



DLC - Myth Buster Webinar

Erico Mattos
GLASE, Executive Director

September, 2021



GLASE
GREENHOUSE LIGHTING
& SYSTEMS ENGINEERING



Myth 2: My grow/crop quality will be negatively impacted using LEDs

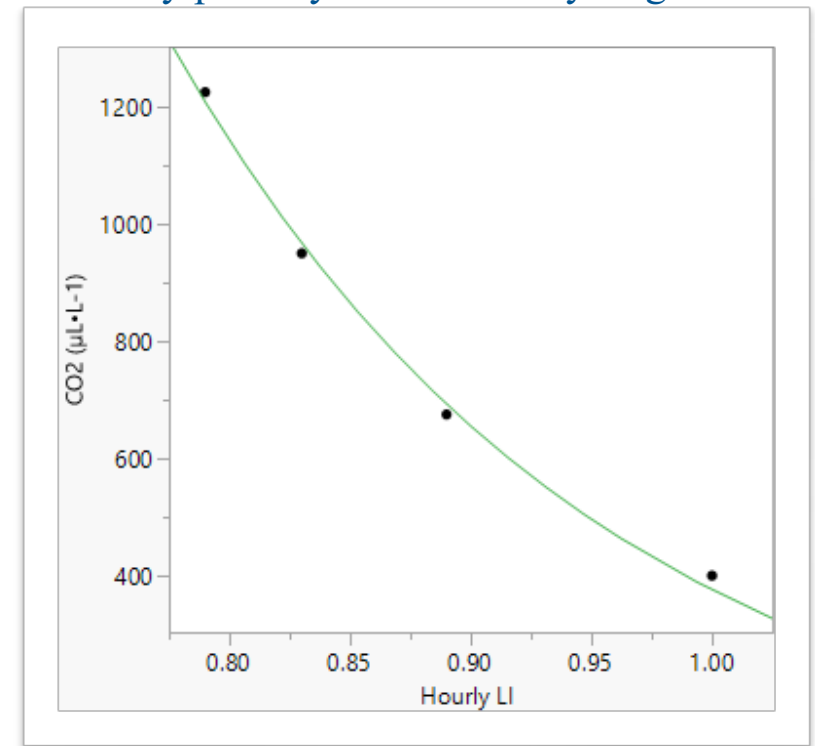


Will LED lighting impact other areas of my grow?

YES

- Water and Nutrients uptake
- Temperature control
- Ventilation control
- CO2 control
- Dehumidification

Strawberry photosynthetic activity: Light vs CO2





Does making my lighting smart actually improve productivity/profitability?

YES

- Crop production consistency
- Energy savings
- Systems integration
- Data analyses
- Crop specificity





If my system and grow process is already designed and built for DE HPS, **why would I start to change** light output or spectral distribution?

To improve
Productivity
and
Profitability

- Capital Investment
- Operational Expenses
- Rebates programs
- Financing opportunities
- Return on Investment

Module 5: ECONOMICS OF CROP LIGHTING
Determine the installation and operating costs of crop lighting systems and estimate return on investment

11 November
2-4pm EST

Marc van Iersel	Calculation tools to assess installation costs
Paul Sellow	Case study: Switching from HPS to LED
Ben Campbell	Return on investment
Paal Elftuin	Financing opportunities

Interactive Tool Demo
Lighting cost calculator: Spreadsheet calculation to compare installation & operating costs of crop lighting system



Do LEDs only work for certain cultivars or crops overall?

Overall

- Customization
- Specific needs
- Do NOT generalize



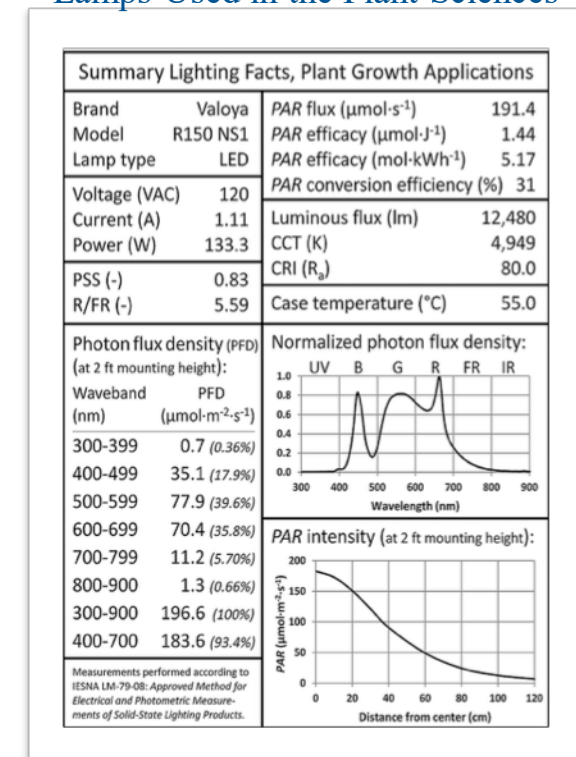


What spectrum/color temperature should my LED be?

Depend

- Indoor vs Greenhouse
- Application
- Efficacy
- ePAR (400 - 750nm)
- Lighting Label

Proposed Product Label for Electric Lamps Used in the Plant Sciences



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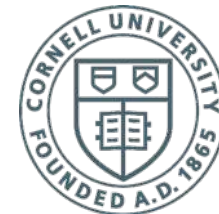
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Evergreen
Consulting Group



Myth #3: LED products are unaffordable and/or untrustworthy

September 2021

Affordability



Created by Cuputo
from Noun Project

First cost is a
major concern

LED prices falling
over time

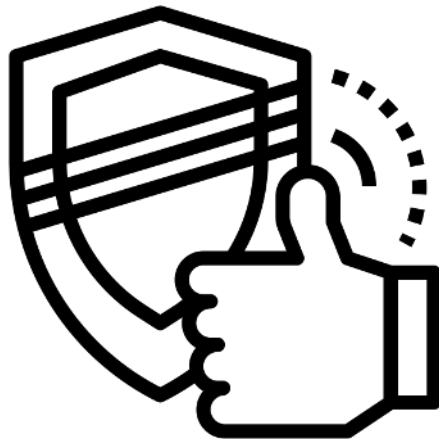
LED lifetime
should be
considered in cost

Wide range of
prices and quality

Utility incentives

Energy bill savings

Reliability



Created by supalerk laipawat
from Noun Project

Lifetime of
drivers and
fans

Photon Flux
Maintenance

Ambient
temperature

Warranty

Spectrum

Safety
certifications

Manufacturer
Legitimacy

Efficacy

Thank you!

Lauren.Morlino@evergreen-efficiency.com

Q&A

- Unmute and ask questions
- OR**
- Send chat to the group



See y'all next time!

- Thank you for your participation!
- Your feedback is key – post event survey incoming