insideGROWER

FEATURES

4/30/2025

Comparison Shopping Gets Easier

Gretchen Schimelpfenig

For some time, LED lights were the next frontier for agricultural technology. What was once described as “The Wild West” in 2019, the horticultural lighting market had no clear standards for performance, so it was hard to shop for products and compare apples-to-apples. Today, the landscape is clearer than ever. Experts are gathering to determine how to make technology selection even easier.

Lighting evolution

Industry organizations play a crucial role in adding tools and resources to markets to help businesses make design decisions. The DesignLights Consortium (DLC) is a non-profit organization that guides the commercial and horticultural lighting industry by developing a set of centralized technical requirements based on industry-developed standards that enable it to assess the highest-performing products in an apples-to-apples way to boost consumer trust and adoption of technology that saves the most energy.

Growing with efficient lights saves businesses money. Since 2018, the DLC has helped growers choose LED horticultural lights for a wide range of greenhouse and vertical farming applications with their Horticultural Lighting Qualified Product List (Hort QPL), a living database of qualified technology that meets DLC technical requirements and passes third-party laboratory testing. There’s no charge to access the list, but requires setting up a free account.

The industry-standard metric for energy performance for horticultural lights used by the DLC is photosynthetic photon efficacy (PPE). In their Hort V3.0 Technical Requirements, the PPE threshold increased to a minimum of 2.30 µmol per joule. DLC-listed lights on the Hort QPL today perform 35% better than the most efficient non-LED option. Many state and utility efficiency programs require horticultural lighting fixtures to be listed on DLC’s Hort QPL to qualify for incentives to adopt energy-efficient LEDs, ensuring that they meet these minimum requirements. These technical requirements are updated following a two- to three-year revision cycle with the DLC’s Hort V4.0 Technical Requirements set to be released in the coming weeks, resulting in an increase to the PPE threshold for all V4 qualified products.

Comparing controls

Now that growers can easily compare lighting product performance, what's the next energy-saving technology to support? The DLC is exploring horticultural lighting controls for their next qualified products library (QPL). LEDs aren't just replacements for HID fixtures; rather they offer many control opportunities (dimmability, spectrum) that can allow you to more effectively provide light when plants need it.

Since October 2023, the Horticultural Lighting Controls Working Group met quarterly to see if the industry needs a second list—one for verified Networked Lighting Controls (NLC) products specific to controlled environment agricultural applications—and what type of control systems could make the cut.

"We are making recommendations on what we need to do from a technical and market need," shared Kasey Holland, Horticultural Lighting Technical Manager at the DLC and organizer of the Horticultural Lighting Controls Working Group.

Members of the Horticultural Lighting Controls Working Group guiding the DLC's work include:

- Mikhail Sagal, TSRgrow
- Erik Runkle, Michigan State University—College of Agriculture & Natural Resources
- Gretchen Schimelpfenig, Cornell University Greenhouse Lighting & Systems Engineering (GLASE) consortium
- Eric Eisele, GrowFlux
- Mark Blonquist, Apogee Instruments
- Cristin Dziekonski, Fluence
- Ihor Lys, Agnetix
- Francois R. Moisan, Sollum Technologies
- Emmanuel W J L Oomen, Hawthorne Gardening Company

GLASE offers a unique perspective on the Working Group as one of two members representing the academic research community. GLASE's work in lighting controls began in the 1990s when Dr. Lou Albright and other researchers at Cornell University invented and started testing the Light and Shade System Implementation (LASSI) algorithm to coordinate control of Daily Light Integral (DLI) and CO_2 in greenhouses. LASSI tracks a DLI trajectory for each day and makes coordinated lighting and shade curtain decisions to meet minimum DLI (to maintain crop growth), but avoid excess supplemental lighting (to save energy). Today, GLASE researchers are experimenting in their labs and at commercial greenhouses to prove how much energy and money lighting controls can save growers.

GLASE researchers at Cornell University have also developed and tested new versions of the LASSI algorithm to take advantage of LED capabilities.

"Real-Time (RT) LASSI adjusts output of LED fixtures to complement sunlight to achieve an instantaneous PPFD target. This effectively takes the same DLI target, but avoids over-lighting a crop when sunlight is already moderately high. RT LASSI controls provide a more uniform delivery of light, save energy and enhance crop responses," noted Dr. Neil Mattson, Professor at Cornell University and Principal Investigator for GLASE.

Goals for the future

In 2025, the DLC Horticultural Lighting Controls Working Group intends to expand its scope and industry representation.

“We want to dig in deeper on lighting-to-non-lighting integration opportunities,” said Kasey. “Then we can make a more informed decision on what to develop. It could be something similar to the commercial and industrial Networked Lighting Controls Technical Requirements and QPL.”

In tandem, GLASE will launch more educational tools and resources related to lighting controls to share new DLC resources that will help growers select energy-saving lighting controls products. Watch existing GLASE webinars and short courses, including the Plant Lighting Short Course in the GLASE Library.

Ways growers can give feedback

The DLC helps decision-makers with data and resources, and with your feedback, those tools can be better catered to serve you.

Do you have questions or insights to share about how you can grow smarter with energy-efficient lighting and controls? Reach out to the DLC Team at horticulture@designlights.org to share your insights and learn more about how the Horticultural Lighting Qualified Products List can help you find the best lighting solution that will help you save energy and cut costs.

Gretchen Schimelpfenig is the Executive Director of Cornell University’s Greenhouse Lighting and Systems Engineering (GLASE), an academic consortium pioneering climate-smart agricultural technology demonstrations and workforce development. She’s worked with hundreds of growers and researchers to optimize greenhouses and indoor farms through her emerging technology research, efficiency program implementation and consultation with growers across North America. Gretchen lives in Vermont with her partner, their five cats and many houseplants. You can reach her at ges252@cornell.edu.

More Resources

DesignLights Consortium: designlights.org

Horticultural Lighting Qualified Product List (requires free account): designlights.org/mydlc

The GLASE Library: glase.mclms.net