LumiGrow Inc. 2019 Station Report

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Personnel

- Eli Weissman was hired as a research technician in April 2018. He specializes in experimental design and data analysis.
- Jessica Vaughan joined as a Grower Consultant in October 2018. She supports horticultural growers with external trial support and educational outreach.
- Jake Holley departed LumiGrow in June 2018 to pursue a PhD in Horticulture under Dr. Neil Mattson at Cornell University.

New Equipment and Facilities

- Expanded research lighting installation at Cabrillo College (Aptos, CA) with newest LumiGrow TopLight and sensor technology to an additional 225 m^2 (2,450 ft^2), bringing total lighting research and teaching space to 630 m^2 (6,800 ft^2).
- Deployed tunable far-red prototype fixtures at Michigan State University to study the effects of dynamic far-red spectrum on ornamental flowering.

Accomplishment Summaries

- SmartPAR sensor-actuated DLI control commercially deployed at over a dozen locations. Total customers using smartPAR for spectral lighting strategies up to over 150.
- New high-intensity greenhouse TopLight fixture received UL and UL Canada certification, IP 67 rating and pending listing on DLC Horticultural Lighting qualified product list.
- During winter 2018-19, smartPAR DLI controlled fixtures supplemented solar light to within 2% of the target 18 $mol \cdot m^{-2} \cdot s^{-1}$ DLI on greater than 90% of days at Harrow Research and Development Centre.

Impact Statements

- Ornamental perennial species *Leucanthemum*, *Phlox*, and *Rudbeckia* had increased branching and flower number when grown under 90 $\mu mol \cdot m^{-2} \cdot s^{-1}$ Compared to those grown under photoperiodic lighting and Phlox grown under 90 $\mu mol \cdot m^{-2} \cdot s^{-1}$ from LEDs flowered 9 days earlier compared to those grown under HPS lamps at a similar intensity.
- During the transplant phase, under a DLI of 16 $mol \cdot m^{-2} \cdot s^{-1}$, lettuce growth increased as the photoperiod was increased from 16-hr to 24-hr
- Providing *Kalanchoe blossfelidana* with 85 $\mu mol \cdot m^{-2} \cdot s^{-1}$ during the long-day and short-day phases results in increased flower number and more compact plants compared to lighting during the long-day phase alone.

Published Written Works and Presentations

Holley, J., R. Shuster, B. Poel, and M. Yelton. 2018. Production of Lettuce Increases By Utilizing a Longer Photoperiod with Consistent Daily Light Integral in Greenhouse Environments. 2018 ASHS Annual Conference (oral abstract).

Holley, J., B. Poel, and M. Yelton. Using a High Yield Photoperiod to Increase Lettuce Production by 40%. 2018. LumiGrow White Paper.

Lopez, R., A. Soster, B. Poel, and M. Yelton. Supplemental LED Lighting Produces Higher Quality Long-day Perennials. 2019. LumiGrow White Paper.

Poel, B., M. Yelton, A. Farkas, and B. El-Hassan. 2018. Assessing the Application of Supplemental Lighting for Short-day Crops Using Light-emitting Diodes. 2018 ASHS Annual Conference (poster abstract).

Poel, B., J. Holley, and M. Yelton. 2018. Successes and Challenges in Taking a Scientific Approach to Grower Trials with Light-emitting Diodes. 2018 ASHS Annual Conference (oral abstract).

Yelton, M. 2018. Bright Ideas: What Light-Science is Revealing About LED, HPS, HID & Yield. 2018 Grow Up Conference – Invited Speaker

Yelton, M. 2018. How Smart Lighting Will Change the Way You Grow. Lift Cannabis Expo – Invited Speaker.

About LumiGrow Inc.

LumiGrow is a smart horticultural lighting company, focusing on technologies that provide researchers and growers with innovative solutions using light as a growth variable. Our mission is empowering growth through connectivity and to create a connected lighting environment for plants and people to thrive.