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New Equipment and Facilities

- A new controlled environment plant growth facility is nearing completion at Fluence. The new facility consists of eight climate-controlled walk in growth chambers. Each chamber has temperature and humidity control with four chambers being equipped with CO₂ injection systems. Temperature and relative humidity data will be collected with a Campbell Scientific CR1000 data logger with EE181-L air temperature and relative humidity probes mounted in aspirated radiation shields.



Unique Plant Responses

- Fluence performs internal research and collaborates with partners from academia and the controlled environment agriculture (CEA) industry. The focus of our research is to determine the influence of light intensity and spectral light quality on the growth, development, and phytochemical concentration of multiple plant species. We have found the following unique plant responses this past year:
 - Increased biomass accumulation when leafy greens were grown under broad spectrum LEDs as compared to narrow band (Red:Blue) LEDs in sole-source lighting environments.
 - Phytochrome photoequilibrium (PPE) influenced flowering of long-day and short-day bedding plant species.
 - Light intensity influenced anthocyanin accumulation and plant morphology of microgreens.

Accomplishment Summary

- Shenandoah Growers, the largest retail grower of organic herbs in the United States, recently deployed thousands of Fluence LED systems in its state-of-the-art vertical farm and greenhouse facilities. With the new Fluence lighting systems, Shenandoah Growers boosted crop yield and quality while reducing land, water and fertilizer resources.





Impact Statement

- Fluence Bioengineering LED-based lighting systems are designed to provide high levels of photosynthetically active radiation (PAR) ideal for commercial cultivation and research applications. From sole-source lighting to supplemental greenhouse lighting, we custom tailor our light spectrum and form-factors to optimize plant growth and increase yields while consuming less energy and reducing operating costs versus legacy technologies.

Published Written Works

- Gerovac, J.R. 2017. Understand Energy Efficiency of Horticulture Lighting Systems. LEDs Magazine. 96:41 – 45.
- Gerovac, J.R. 2017. Why Humans use Lumens and Plants use Par. Maximum Yield (18)11:80 – 81.
- Contrisciano, T. and J.R. Gerovac. 2017. Charting a course for LEDs. GrowerTalks. (11)80:60 – 63.
- Gerovac, J.R. 2017. Learn Your LEDs: Lighting Metrics for Growers. Maximum Yield (19)1:46 – 52.

Website

- <https://fluence.science>