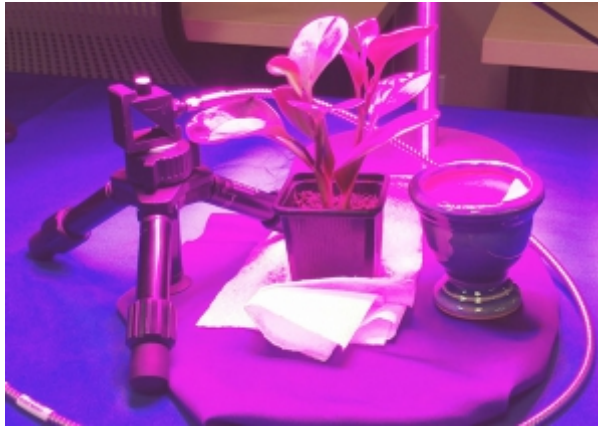


Horticultural Lighting Conference Report



Wednesday, 06 December 2017

On October 17, 2017, the Horticultural Lighting Conference met in Denver, Colorado to discuss the latest trends, techniques, and technologies in the North American horticultural lighting market. Nearly 300 people from around the world attended to learn and share about this rapidly growing market. Additionally, the attendees came from many backgrounds such as commercial growers, greenhouse manufacturers, universities and government to name a few. Attendees benefited by learning such things as the growing science behind year-round crop production, as well as networking opportunities and business model solutions for challenges in the horticultural lighting market.

Some of the conference keynotes included

- Speaking Plant: Language of Horticultural Metrics, test methods and standards
- Maximizing Growth, Minimizing Electrons: Utility Horticulture Incentive Strategies
- Dynamic LED Lighting for Precision Crop Control
- Closing Plenary - Fast-forwarding the Future of Food

Equipment Demonstrations



Avantes, Inc. participated in the event by presenting two demos which showcased our spectrometers' LED lamp capabilities:

Demo 1: Grow LED Lamp

Measurements

The first Avantes demo used an irradiance calibrated AvaSpec-Mini2048L calibrated for the 360-880 nm wavelength range, paired with a quartz-radon cosine corrector as the collection optic. Several parameters of an LED grow lamp were simultaneously measured, including P.A.R. (photoactive response), the daily light integral, spectral intensity ($[\mu\text{Watts}/\text{cm}^2]/\text{nm}$), and raw photon count. These measurements are used by growers when profiling the growing conditions of their crops and provide insight into how plants react to the light that feeds them. This compact, portable, and easy to use system is a powerful tool in the horticultural space allowing growers to validate the quality of their grow lights, quantify the amount of light across the spectrum received by the plant, and to monitor many other photonic parameters relevant to the industry.

Demo 2: System Development Capabilities

The second demo presented at the Horticultural Lighting conference was an example of a commercial system Avantes developed with partners. This system, called the Hortispec, includes an Avantes AvaSpec-ULS2048L (Ultra Low Straylight) spectrometer and ethernet communication connection for remote measurements facilitated by intranet servers.

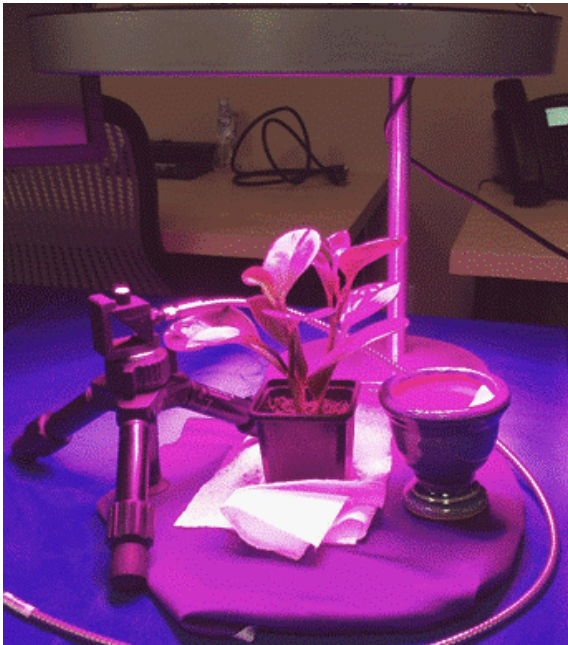
The Hortispec is a fantastic example of the possibilities for spectrometer deployment; packaged inside a weather-proof housing for humidity control this system is a perfect design for monitoring large facility from one central location.



The Future of Farming

The Netherlands, home to Avantes, is known worldwide for advances in indoor farming. This tiny nation leads the world in indoor growing operations. The Dutch lead the world in exports of tomatoes, potatoes, and onions and are the world's second-largest exporter of vegetables overall, based on value, and more than a third of all vegetable seeds in the world originate in the Netherlands. This tiny nation accomplishes this feat through the innovative use of LED lighting, 24-hour cultivation and climate-controlled greenhouses, some of them covering as much as 175 square acres.

For Avantes, with its mission to enrich the lives of mankind through the use of our innovative measuring equipment, working with horticultural experts from growers to LED lighting engineers is all part of the job. Find out how we can help you achieve the measurements you need in your horticultural application.



References

Martinez, Sandra (2015) "High-Tech Dutch Trend of 'City Farming' Grows Food Faster without Sunlight | MLive.com," May 26, 2017. Accessed 12/6/17 http://www.mlive.com/business/west-michigan/index.ssf/2015/05/high-tech_dutch_farming_grows.html

Viviano, Frank (2017) "How the Netherlands Feeds the World," | National Geographic. Accessed

12/6/17 <https://www.nationalgeographic.com/magazine/2017/09/holland-agriculture-sustainable-farming/>



SPECTRAL TECHNOLOGY INSTRUMENT CO.,LTD.
บริษัท สเปคตรัล เทคโนโลยี อินสตรูเมนต์ จำกัด

99/532 Rat Phattana 22 Rd., Rat Phattana,
Saphansung, Bangkok 10240 Thailand.
Tel : 02-729 0927 Fax : 02-729 1348

Email : info@spectralinstrument.com
Web : www.spectralinstrument.com