2024 NCERA Annual Station Reports---Hawaii

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1. **New Facilities and Equipment**
   Digital Wind/Temp/RH Meter
   Temp/RH/CO_2 Meter - Handheld
   IR Temperature Meter with Temp Probe
   Temperature/RH Pen
   LightScout Quantum Meter – External Sensor
   LED grow lights
   Lunar/Martian model greenhouse

2. **Unique Plant Reponses**
   The objective of this study was to compare the effects of red and blue LED lighting on the growth of ‘Koba’ green onion plants in a noncirculating hydroponic system. ‘Koba’ green onion (*Allium fistulosum*) seeds were germinated in Oasis® cubes under T5 high output fluorescent lighting in the lab. Seedlings were then transferred to 5.1-cm net pots, which were placed in 1.9-liter containers containing a hydroponic nutrient solution of Hydro-Gardens' Chem-Gro lettuce formula 8-15-36 hydroponic fertilizer with added calcium nitrate (19% Ca and 15.5% N) and magnesium sulfate (9.8% Mg and 12.9% SO_4). Half of the seedlings were grown under red LED lighting (82 µmol/m^2/s, 12-h photoperiod) and half under blue LED lighting (82 µmol/m^2/s, 12-h photoperiod). Data was collected at the end of the experiment. At the end of the study, there were significant differences in plant height, number of leaves per plant, stem diameter, total leaf length per plant, leaf dry weight per plant, and root dry weight per plant. For all these variables, red LED lighting resulted in greater values than those for blue LED lighting. In conclusion, different LED lighting could be used to supply artificial lighting for ‘Koba’ green onion plants. Red LED lighting enhanced the growth of ‘Koba’ green onions.

3. **Accomplishments**
   At the end of the study, there were significant differences in plant height, number of leaves per plant, stem diameter, total leaf length per plant, leaf dry weight per plant, and root dry weight per plant. For all these variables, red LED lighting resulted in greater values than those for blue LED lighting. In conclusion, different LED lighting could be used to supply artificial lighting for ‘Koba’ green onion plants. Red LED lighting enhanced the growth of ‘Koba’ green onions.

4. **Impact Statements**
   Different LED lighting could be used to supply artificial lighting for ‘Koba’ green onion plants. Red LED lighting enhanced the growth of ‘Koba’ green onions.

5. Published Written Works

Poster Presentations

Kobayashi, K.D. and B. Nelson. 2023. LED and fluorescent lighting effects on hydroponically grown ‘UH Manoa’ lettuce and ‘Hirayama’ kai choy. HortScience 58(9) Supplement:S274 (poster presentation).

Popular Articles

Kurasaki, R., M. Byrd, and K. Kobayashi. 2023. Low-cost light sensors for indoor agriculture. Extension Bulletin CTAHR FST-68.