How sole-source LEDs impact growth of Brassica microgreens

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Photo of mustard microgreens grown under sole-source (SS) lighting using light-emitting diodes (LEDs) with a light ratio of red:green:blue 74:18:8 (R_{74}:G_{18}:B_8). Credit: Joshua Craver.

Microgreens and baby greens are a relatively new specialty crop seen in

many upscale markets and restaurants. Favored by chefs and consumers, microgreens are used to enhance the flavor, color, and texture of foods, and some species have the added benefit of high concentrations of health-promoting phytochemicals. As consumer demand for these specialty crops increases, commercial greenhouse growers are becoming more interested in producing microgreens for market, and scientists are working to find the best production practices for growers. A study published in the May 2016 issue of *HortScience* offers important recommendations for lighting practices in microgreen production systems.

The study was designed to investigate the effects of sole-source (SS) light-emitting diodes (LEDs) of different light qualities and intensities on growth, morphology, and nutrient content of the *Brassica* microgreens. Corresponding author Roberto Lopez explained that LEDs offer many advantages over conventional light sources, including the ability to select light qualities and intensities that have beneficial effects on plants. "Although previous reports have indicated that light intensity (LI) or light quality (LQ) from SS LEDs had an effect on the growth of microgreens and baby greens, little work has been published on the interaction between LI and LQ on the growth and nutrient content of *Brassica* microgreens," Lopez said.

Microgreens purple kohlrabi, mizuna, and mustard were grown in hydroponic tray systems placed on multilayer shelves in a walk-in growth chamber. The experiments used LED arrays providing light ratios of red:green:blue 74:18:8 (R_{74}:G_{18}:B_8), red:blue 87:13 (R_{87}:B_{13}), or red:far-red:blue 84:7:9 (R_{84}:FR_7:B_9) with three light intensity treatments. The researchers analyzed treatments for effects on microgreen growth, morphology, and nutrient content.

For all three species of *Brassica*, hypocotyl length decreased as light intensity increased, while percent dry weight increased with increasing

light intensity (regardless of light quality). Additionally, nutrient content of both macro- and micronutrients decreased as light intensity increased for all three species. Relative chlorophyll content of mizuna and mustard was not significantly influenced by light intensity or light quality; however, leaf area of kohlrabi generally decreased and relative chlorophyll content increased with increasing light intensity.

The authors said that growers can use the data presented in the study to select the best "light recipes" to achieve preferred growth characteristics of *Brassica* microgreens.

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