Special Issue

The Effect of LED Light Spectra on the Growth, Yield, and Nutritional Value of Crops

Message from the Guest Editors

The spectral quality of light, combined with the irradiance and photoperiod, plays a key role in plants, influencing the morphological and functional traits of development, adaption, and growth. Light-emitting diodes (LEDs) control key physiological processes, such as phototropism, the immigration of chloroplasts, day/night period control, and the opening/closing of stomata. While LEDs can provide the specific wavelengths needed for optimal plant growth, the optimal light spectrum can vary depending on the specific crop and growing conditions. Identifying the essential wavelength ranges for controlled environmental growth in vegetable and herbs is a challenge. LEDs offer the possibility of communicating with the light sensors in plants to regulate their metabolism, biomass production—in the greenhouse, in vitro, and in a controlled environment—and stress reduction via the activation of the metabolic pathways memorized within the genome. Keeping in mind that LEDs also offer advantages in terms of sustainability and significant implications for indoor and vertical farming.

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