Complementary LED light spectra reduces the adverse effects of salinity and alkalinity on strawberry plants

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Abstract
The purpose of this experiment was to investigate the effect of different spectra of complementary light on the growth and development of strawberry plants under salinity and alkalinity stress conditions. Plants were grown in the greenhouse under ambient light and irradiated with blue (460 nm), red (660 nm), blue/red (1:3), and white/yellow (400-700 nm) light during the developmental stages. The stress treatments were as follows: control (non-stress), alkalinity (40 mM $NaHCO_3$), and salinity (80 mM NaCl). Our results showed that salinity and alkalinity stress decreased dry weights. The blue and red spectra had a greater effect on reducing the effects of stress compared to other spectra. Stress conditions decreased SPAD, although blue light increased SPAD under stress conditions. Blue/red and white/yellow light had the greatest effect on reproductive traits. Salinity and alkalinity stress decreased OJIP curves compared to the control treatment. In salinity and alkaline stress, the blue and red spectra increased the OJIP curves in plants, respectively. It can be concluded that the effects of salinity and alkalinity stresses can be reduced by manipulating the supplemental light spectrum. The use of artificial light can be extended to stresses.

Keywords: Abiotic stress, Fluorescence, Light Emitted Diodes, Vegetative growth