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Effects of Red-light Intensity during Long-day Treatment and Cut Flower Quality in *Eustoma grandiflorum* Cultivars for autumn Shipment

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Long-day treatment by pre-dawn lighting (6 h) was applied to *Eustoma grandiflorum* cultivars to investigate flowering responses and cut flower qualities for autumn shipment. Seedlings were irradiated by using bulb-type red-light fluorescent lamps (FR ratio was 8.8, with photon flux density (PFD) of red-light (660 ± 10 nm) of $0.5 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$). Control plants were grown under ambient day conditions without long-day treatment. The times from planting to flower budding

treatments were significantly longer than that of the controls. However, a significant difference among the times from planting to flower budding was observed. Long-day treatment with the highest red-light intensity showed the greatest increase in the number of nodes on the main stem at anthesis of the first floret. The plants grown under long-day treatment with red-light intensities above 0.2 μmol photons m⁻² s⁻¹ were significantly longer than that of the control. Long-day treatment using fluorescent lamps was applied to 11 *Eustoma* cultivars. Compared with control plants, the times from planting to flower budding under long-day treatment increased in 10 cultivars and the number of nodes on the main stem at anthesis of the first floret increased to a maximum of 2.4 in 10 cultivars. Moreover, cut flower length under long-day treatment was 11.3 cm longer at maximum and cut flower weight was 1.2 g heavier in 10 cultivars at harvest (at anthesis of the third floret) compared with the control. The increase in the number of nodes on the main stem under long-day treatment was significantly correlated with the days to flowering in the controls.

Key Words: [cut flower length](#), [flowering response](#), [photomorphogenesis](#)

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