Effects of day length, light spectral quality and quantity on phenology and development of redroot pigweed (*Amaranthus retroflexus* L.)

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**Abstract**

The effects of day length, light spectral quality, and light quantity on the development of redroot pigweed (*Amaranthus retroflexus* L.) were studied in a greenhouse experiment. The study was conducted under a 16-h daylight photoperiod with a PPFD of 300 μmol m⁻² s⁻¹, using a 4:1 (R:FR) light ratio. Plants were grown in a greenhouse under controlled conditions, with a PPFD of 300 μmol m⁻² s⁻¹, using a 4:1 (R:FR) light ratio. The results showed that day length, light spectral quality, and light quantity had a significant effect on the development of redroot pigweed. The study provided valuable insights into the responses of redroot pigweed to changes in environmental factors, which can be used to develop effective management strategies to control the growth and development of the weed.