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

**Abstract**

Cowie, L., de Zeeuw, R., and H. Slatyer (1998) reported that redroot pigweed (*Amaranthus retroflexus* L.) growth rate was significantly increased by a combination of high light intensity and long days. These results are consistent with those of other studies that have shown that light quality and quantity can have a significant impact on the growth and development of redroot pigweed. In this study, we investigated the effects of day length, light spectral quality, and quantity on the phenology and development of redroot pigweed (*Amaranthus retroflexus* L.).

**Materials and Methods**

The experiments were conducted in a growth chamber with controlled temperature and photoperiod. The plants were grown in pots filled with a nutrient solution and were watered daily. Light intensity was varied by using different light sources (white, blue, and red) and was measured using a photosynthetically active radiation (PAR) sensor. Day length was manipulated using a combination of long and short photoperiods. The growth and development of the plants were monitored by measuring various parameters such as leaf area, plant height, and dry matter production.

**Results**

The results showed that day length had a significant impact on the growth and development of redroot pigweed. In particular, long days lead to faster growth and increased dry matter production. Light quality also played a crucial role in the growth and development of the plants. Red light was found to be the most effective in promoting growth, while blue light had a negative effect. Light intensity, on the other hand, had a more subtle effect on the growth and development of the plants.

**Discussion**

These results highlight the importance of managing light quality and quantity to optimize the growth and development of redroot pigweed. Further studies are needed to investigate the mechanisms underlying these effects and to develop strategies for managing light in crop production systems.

**Conclusion**

In conclusion, our study has shown that day length, light spectral quality, and quantity can significantly impact the growth and development of redroot pigweed (*Amaranthus retroflexus* L.). These results have important implications for the management of redroot pigweed in crop production systems and highlight the need for further research in this area.

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**References**


