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

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Phenology and development of redroot pigweed (Amaranthus retroflexus L.) is influenced by day length, light spectral quality and quantity. These factors interact and affect the plant's growth and reproductive stages. The study by Cowan et al. (1998) and Dieleman et al. (1995) showed that PPFD (photosynthetic photon flux density) and R:FR (red:far-red) ratio are critical for the development of pigweed. The research by Horak and Loughin (2000) and Weaver and McWilliams (1980) further elucidated the role of light quality and quantity in the plant's response.

Critical points of note:
- PPFD and R:FR ratio significantly influence the growth and development of pigweed.
- Higher PPFD and lower R:FR ratios promote faster growth and flowering.
- Different light quality and quantity combinations alter the plant's reproductive strategy.

Research methodology:
- Field trials under controlled light conditions were conducted.
- The effects of varying day lengths and light spectra were observed.
- Photosynthetic rates and growth parameters were measured.

Conclusions:
- Optimal conditions for pigweed growth and development can be achieved through precise control of light quality and quantity.
- Further research is needed to understand the long-term effects of light on pigweed populations in agricultural settings.

Further reading: