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## Introduction

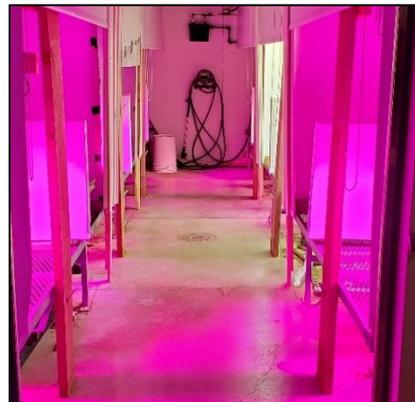
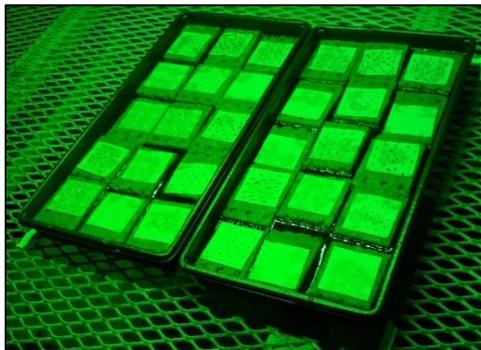
Artificial lights, e.g., LEDs, are increasingly being used for controlled environment seedling transplant production to improve resource use efficiency and plant quality. Aspects of ornamental plant propagation in controlled environments, such as seed germination and seedling growth, could benefit from an optimal light recipe. The objectives of this research were to investigate the effects of different light qualities on seed germination and seedling growth of some common ornamental species such as gerbera. The goals of this research are to give commercial growers recommendations on light recipes to improve ornamental seed germination and to grow high-quality seedlings.

## Methods: Seed germination

- 14 cultivars from Begonia, Echinacea, Gerbera, Petunia, and Vinca were germinated on filter paper/rockwool in a growth chamber at 23 °C and 70% RH
- Treatments: Red, Blue, Green, Far-Red LED, and UVB fluorescent light or dark (D)
- PFD:  $\approx 18 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$  for R, B, G and FR, and  $\approx 0.4 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$  for UVB all on 24 h photoperiod

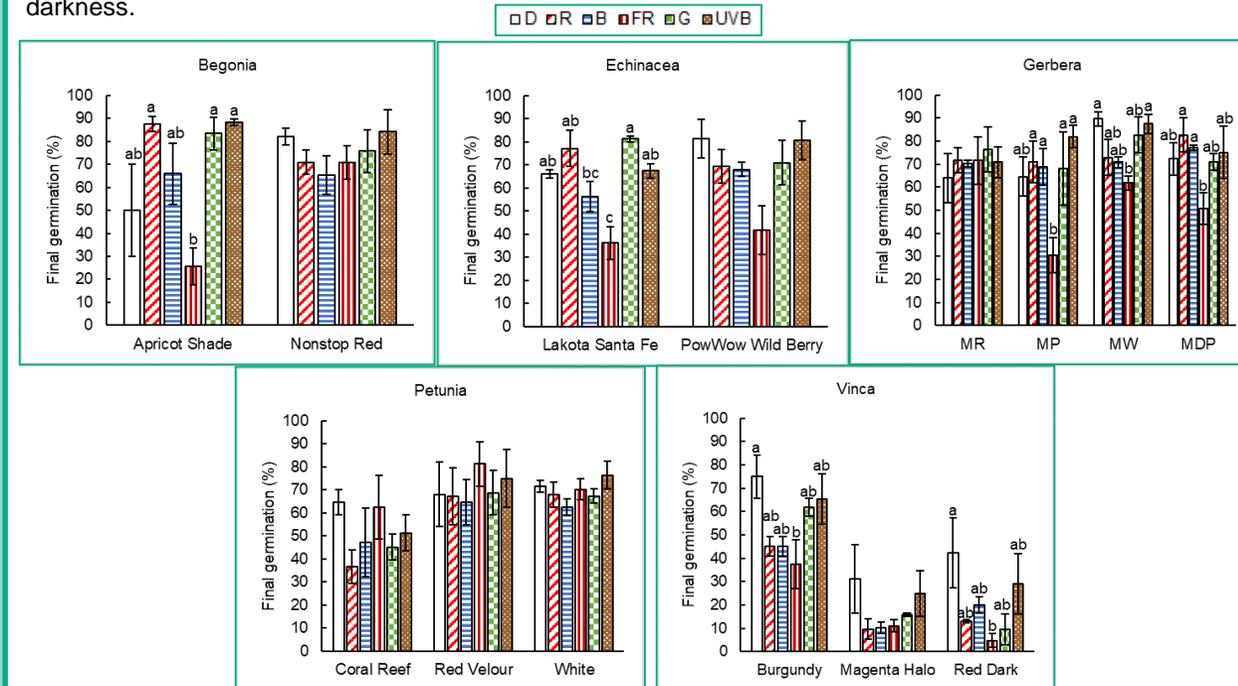
## Methods: Seedling performance

- Four gerbera cultivars (MR, MP, MW, MDP) were sown from seed and grown for  $\approx 5$  weeks in a growth chamber at 21 °C and 70% RH
- Light treatments: fluorescent, RB-LED, RB+UVB, RB+UVA, RB+G and RB+FR
- PPFD:  $\approx 165 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$  for 16 h (DLI= $9.5 \text{ mol}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$ )



## Results

Different species/cultivars responded differently to different light qualities but generally, light treatments did not promote germination compared to darkness. In many cases, FR light inhibited seed germination relative to darkness.



For the four tested gerbera cultivars, plants grown under RB were of similar quality to fluorescent light except for a wider canopy in 'Majorette Red Dark Eye' (MR). Compared to RB, adding a third light wavelength (i.e., UVB, UVA, G or FR) did not affect growth and morphology except for a thicker stem in 'Maxi Pink' (MP) under RB+FR. Generally, there were no differences among all the light treatments for all gerbera cultivars.

## Conclusions

- Seed germination: The germination response was generally indifferent to monochromatic light, except for FR light. Among the tested light treatments, R, G or UVB appear to be the best.
- Seedling performance: RB-LED can potentially replace fluorescent light in controlled environment ornamental transplant production.