

Impact of high temperatures on several poinsettia varieties

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Introduction

- Poinsettias, *Euphorbia pulcherrima* are a popular and economically important holiday plant in the US. In 2010, they were the #2 potted flowering crop sold in the US, with a wholesale value of \$146 million (1).
- Poinsettias are short-day plants – they initiate flowering in response to nights of 12 or more hours of darkness (2). Higher temperatures increase the length of darkness required to initiate color development, and distort bract formation.
- This is known as heat delay, which ultimately leads to green, flimsy plants not fit for sale, and loss of profit results.

Background

- Research has been conducted on a handful of varieties, investigating how the date of first color, visible bud, and anthesis are impacted by higher temperatures (3,4).
- Results have shown that heat delay sensitivity is cultivar-dependent, and that closely-related cultivars demonstrate similar sensitivities (3).

Objective

- We investigated the impact of higher temperatures on several varieties to inform poinsettia growers on which varieties will best suit their climate
- Varieties studied: Lyra Red, Orion Early Red, Mirage Red, Cortez Burgundy, Astro Red, Pon128 Virgo White, and Pon64 Robyn Pink
- 26 plants per variety were used, for a total of 182 plants

Methods

- All 182 plants were grown in greenhouse A from early August – October 1, with weekly height data taken to create growth curves.
- On October 1, the plants were split into two different greenhouses. Half of each variety remained in Greenhouse A (69-79°F), and half were placed in B (75-82°F). Arrangement within the greenhouses was determined by a randomized block created in Microsoft Excel.
- Weekly measurements of plant height were mapped onto growth curves. Weekly photos were taken to provide a visual comparison of the growth and coloration of the varieties kept in different temperatures (Fig. 2).
- Data was also collected on: date of first appearance of color, date of first visible bud, and date of anthesis.

Results

- Cortez Burgundy was most impacted by heat delay, with Greenhouse B initiating color development 20+ days behind Greenhouse A (Fig.1)
- Lyra Red, Pon128 Virgo White, and Pon64 Robyn Pink were moderately impacted, initiating color 4-7 days behind their counterparts in Greenhouse A (Fig.1)
- Orion Early Red, Astro Red, and Mirage Red were minorly impacted, being only 2-3 days behind on color initiation (Fig.1)
- These quantitative results are also supported qualitatively by Fig. 2, which visually displays the heat delay sensitivity of the varieties.

Discussion

- Our results provide information for growers and breeding companies to reference when deciding what varieties to grow
- The study indicates that Astro Red, Orion Early Red, and Mirage Red are suitable for growing in Florida and areas of similar climates
- Data analysis on the relationship between temperature, plant height, and bract size needs to be conducted to further investigate the impact of heat delay on the aesthetic of the plants
- Future research could replicate our experiment on more varieties to continue expanding the knowledge base on heat delay to provide more information to Florida growers and breeders

High temperatures delay color development in certain poinsettia varieties. These varieties are not recommended for growing in hot climates like Florida.

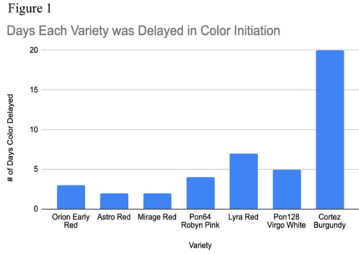


Figure 2 (Below) This figure is comprised of photos of a representative plant from each variety in each greenhouse taken at the end of the season, on December 1. The left column is plants from Greenhouse A (69-79°F), and the right is plants from Greenhouse B (75-82°F).



References:
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 2. Fisher, P., Faust, J., & Tierney, M. (2019, August). Heat delay in poinsettias. *Greenhouse Product News*. Retrieved November, 2020, from <https://www.grower.com/article/heat-delay-in-poinsettias/>
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