

Title Influence of short-term storage temperature and duration of *Canna* rhizomes on subsequent greenhouse forcing

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Abstract

Canna lilies (*Canna* ×*generalis*) are rhizomatous perennials native to regions with subtropical and tropical climates and are grown for their attractive foliage and flowers. Dormant rhizomes are commonly propagated by division and shipped to greenhouse growers for forcing in containers. During shipping, rhizomes can be exposed to low temperatures, yet no research-based information has been published on the effects of subsequent plant performance. We performed an experiment to determine how short-term storage temperature and duration of rhizomes influence forcing in a greenhouse environment. Dormant rhizomes of *Canna* ‘King City Gold’ and ‘Yellow King Humbert’ were received from a commercial grower and were placed inside cardboard shipping boxes. The boxes were placed in environmental growth chambers with temperature set points of 0, 2.5, 5.0, 7.5, or 10.0°C for 2, 4, or 8 d. After storage, rhizomes were planted in 13-cm containers filled with a soilless, peat-based medium and grown in a glass covered greenhouse at a mean daily temperature of 22.9°C and under a mean daily light integral of 15 mol·m⁻²·d⁻¹ and a 16-h photoperiod. Control rhizomes were planted directly into containers and placed in the greenhouse. In both *canna* hybrids, storage duration, but not temperature, affected time to shoot emergence. From the day of planting, shoot emergence of rhizomes stored for 8 d at 0 to 10°C occurred 5 to 10 d later than the control. After 35 d in the greenhouse, rhizomes stored for 8 d at 0°C were a mean of 6.9 to 7.9 cm shorter than the control. *Canna* ‘King City Gold’ stored for 8 d at 0 to 5.0°C had a mean of 1.8 shoots above the media surface after 35 d in the greenhouse while the control had a mean of 2.8 shoots. Storage temperature and duration had no effect on leaf number in both hybrids. Therefore, under the short-term storage conditions provided in this experiment, *canna* rhizomes can be exposed to 0 to 10.0°C for up to 8 d without any effect on survival. However, rhizomes stored for 8 d at these temperatures could have delayed shoot emergence and fewer shoots compared to shorter storage durations.