

Title CA during chilling storage suppresses the induction of daughter bulb enlargement in tulips  
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#### Abstract

Tulip (*Tulipa gesneriana* L. 'Gander') bulbs just after lifting were stored dry at -2°C for 20 weeks under ambient (AA) or 3% O<sub>2</sub> - 3% CO<sub>2</sub> (CA; controlled atmosphere) conditions. Following the storage at -2°C, the bulbs were stored at 20°C for 8 weeks followed by 2°C for 12 weeks in ambient air and then forced hydroponically at 20°C under 12 h photoperiods. At the end of storage at 20°C and at 2°C, the dry weight of inner and outer daughter bulbs (offsets) of the bulbs that had been stored at -2°C in AA (AA bulbs) was greater than that of CA bulbs. The length and dry weight of shoots in the CA bulbs at planting were significantly greater than those of shoots in the AA bulbs. Thirty one percent of the plants from the AA bulbs (AA plants) failed to flower due to the abortion of flower buds during the forcing period, whereas all CA plants flowered. The cut flower quality of the CA plants was superior to that of the AA plants. The dry matter distributed to shoot and daughter bulbs in CA plants was greater than that in AA plants. Thus, the low O<sub>2</sub> and high CO<sub>2</sub> condition during the storage of vegetative bulbs just after lifting suppressed the chilling sensitivity of daughter bulbs needed for their enlargement during the subsequent storage period, and consequently promoting the growth of shoots which compete with the daughter bulbs for assimilate stored in mother bulb scales.