

#### Abstract:

Sprouting of packaged dry-sale lily bulbs can cause significant quality loss in the marketing chain. We have investigated the use of modified low oxygen atmospheres to inhibit shoot growth of packaged bulbs. Bulbs of cultivars 'Marseille', 'Vivaldi', and 'Vermeer' were exposed to humidified atmospheres of 0.5, 1, 2, 4, 8 O<sub>2</sub>% (balance nitrogen), or air (ca. 21% O<sub>2</sub>) under fluorescent light (ca. 75  $\mu\text{mol m}^{-2} \text{s}^{-1}$ ) and 24-25°C. Bulbs were removed after 4 weeks of controlled atmosphere treatment and shoot length determined. Shoots of bulbs stored under 0.5% O<sub>2</sub> died. Bulbs stored in atmospheres of 1% O<sub>2</sub> were significantly shorter than controls, and the degree of shoot growth suppression was cultivar dependent. Control and 8% O<sub>2</sub> bulbs showed significant flower bud development during storage. Treated bulbs were planted and grown in a greenhouse at 19°C. Other bulbs, which had been stored at 1°C and not exposed to CA, were planted as controls. Bulbs stored under 1 and 2% O<sub>2</sub> flowered later and were taller than 4 and 8% O<sub>2</sub> and air controls but were 25 to 30% shorter than (cold-stored, non-CA) control plants and had fewer flower buds. Overall plant quality in 1% and 2% O<sub>2</sub> was superior to (air) controls, 4%, and 8 % O<sub>2</sub> treatments. The time to flower was similar to that of (cold-stored) controls. Results suggest that bulbs stored under low O<sub>2</sub> atmospheres (ca. 1%) at 24-25C produced plants of superior quality compared to bulbs stored in ambient air.