

Abstract

Green celery stalks may be stored at 0–4 °C for up to 2–6 weeks. In those conditions, decay and pithiness develop, and growth of internal leaves continues, lowering quality and reducing shelf life. Controlled atmospheres (CA) could be a useful tool to inhibit those processes. As far as we know there are few reports about the effect of CA with CO₂ levels over 10 kPa on the quality and postharvest life of celery, although it has been reported that celery would not tolerate high CO₂ concentrations. There is also an absence of information on the respiration rate of CA stored celery, which has been estimated as a percentage of that found in air or in a steady state under MAP. The objective of this research was to study the effect of high CO₂ CA over the postharvest behaviour, chemical and sensory quality and physiological disorders of celery stalks stored at 4 °C during 35 days. Green stalks of 25-cm length of ‘Trinova’ celery were placed in sealed glass jars. Humidified CA containing 5 kPa O₂ plus 5, 15 or 25 kPa of CO₂ were passed through the jars using normal air as a control. Respiration rate, ethylene production, soluble solids content, pH, acidity, color, sensory quality and stalk elongation were evaluated. All CA reduced the respiration rate which was 70% of that found in air. Growth of leaves was negatively correlated with CO₂ concentration: the higher the CO₂ level, the lower the leaf growth. CA also decreased the development of pithiness and improved sensory quality, avoiding the cut butt end from browning and keeping the green color. Furthermore, decay development, which for air affected 10% of stalks, was inhibited. In any treatment neither off-odours nor off-flavours were detected. However under 5 kPa O₂+25 kPa CO₂ a slight browning of the internal petioles was observed. After 5 weeks under 5 kPa of O₂ and 15 kPa of CO₂ no decay developed and stalks showed the best quality.