

Title Extending shelf-life of ‘Palmer’ cold stored mangoes using controlled atmosphere with different oxygen levels

Author Gustavo H.A. Teixeira, José F. Durigan, Leandra O. Santos, Flávia O. Ogassavara and Luis C. Cunha júnior

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Abstract

Mango is characterized as a highly perishable tropical fruit, which completes its ripening process in few days after harvest when kept at ambient temperatures. Although cold storage has been used in order to extend shelf-life, it is not totally efficient. Controlled atmosphere in association with low temperature can improve mango storability, however, there is not any recommendation for the variety Palmer. Then, the objective of this study was to evaluate the use of atmospheres with different levels of oxygen during ‘Palmer’ mango cold storage. Mango at maturity stage 1 were stored at 12.8°C under 5 oxygen levels (1%, 5%, 10% and 20%, plus control at cold storage condition) for up to 28 days. Fruit were evaluated at withdraw from the CA containers and after transference to ambient (25.2°C). Low oxygen levels (1% and 5% O₂) did effectively reduced respiration rates. Throughout storage, mangoes kept at these conditions presented significantly lower rates of CO₂ production (15 mg CO₂ kg⁻¹ h⁻¹) and these rates were also lower after 28 days of cold storage plus three days at ambient condition than the other oxygen levels (10%, 15% and 20%) and control. ‘Palmer’ mangoes of all treatments were considered immature at the end of cold storage, however, fruits kept at 1%, 5% and 10% O₂ maintained firmness practically unchanged compared to those kept under higher oxygen atmospheres which firmness reduced considerably. At low oxygen levels (1% and 5% O₂) fruit also presented lower contents of soluble pectin (50 mg 100 g⁻¹), yet colour parameter (L*, hue angle) were not affected by the atmospheres and remained unchanged throughout cold storage. After withdraw from CA containers to ambient, even from the lowest oxygen concentrations (1% and 5% O₂), fruit ripened normally in just 8 days without presenting any symptom of injury which support their use for ‘Palmer’ mango long-term storage.