

Title High levels of carbon dioxide injures guava (*Psidium guajaba* L. cv. 'Pedro Sato') stored under controlled atmospheres

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Abstract

Despite of being the second guava world producer, Brazil exports just 0.06% of its production. It is due to inherent guava characteristics, such as, perishability, high disease susceptibility and reduced shelf-life when kept at ambient temperatures. Traditionally, cold storage has been used in order to extend shelf-life, although it is not totally efficient. Controlled atmosphere in association with low temperature can improve guava storability, however, there is not any complete recommendation for the variety Pedro Sato. Then, the objective of this study was to evaluate the use of different levels of carbon dioxide in association with low oxygen level during 'Pedro Sato' guava cold storage. Guavas at maturity stage 1 were stored at 12.2°C for up to 28 days under 6 atmospheres, as such: 1) 5% O₂, control; 2) 5% O₂+ 1.0% CO₂; 3) 5% O₂+5.0% CO₂; 4) 5% O₂+10% CO₂; 5) 5% O₂+15% CO₂ and 6) 5% O₂+20% CO₂. Fruit were evaluated at withdraw from the CA containers and after transference to ambient (25.5°C). The different atmospheres did not affect the respiration rates of guavas during cold storage. However, after withdraw from CA condition to ambient, fruit kept under higher carbon dioxide atmospheres (5% O₂+15% CO₂ and 5% O₂+20% CO₂) presented sharp leap in these rates what indicates injury from high carbon dioxide exposition. On the other hand, respiration was quite steady when fruit were stored under 5% O₂ and 5% O₂ +1.0% CO₂. Colour parameter were not affected by the atmospheres for up to 14 days of cold storage, yet after 28 days fruit kept under higher CO₂ concentrations (10%, 15% and 20%) presented substantial decrease on hue angle. Guavas from the treatment 5% O₂+20% CO₂ showed a dramatic slump in fruit firmness after just 14 days of storage, from 122 N to 15 N, which was significantly correlated with the increase of soluble pectin contend. After withdraw from containers to ambient, especially after 28 days of cold storage, fruit kept under the highest carbon dioxide levels (5% O₂+10%, 5% O₂+15% and 5% O₂+20%) ripened faster than those kept at 5% O₂+1.0% and 5% O₂+5.0% CO₂, but without presenting visible injury symptoms. However, we recommend a maximum of just 1.0% CO₂ in association with 5% O₂ for 'Pedro Sato' long-term storage.

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