

Effect of cold storage on the postharvest quality of different Tarocco sweet orange clonal selections

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Abstract

Fruits of sixteen Tarocco sweet orange (*Citrus sinensis* [L.] Osbeck) clonal selections were compared for their long-period cold storage aptitude, for fresh fruit consumption. Selections were evaluated, for two consecutive seasons, at harvest (T0) and after 30 (T30), 60 (T60) days of storage at 5 ± 1 °C and 85–90% relative humidity (RH), followed by 7 days of shelf-life at 20 ± 2 °C (T60+7). The following parameters were evaluated: fruit weight, peel and pulp color, initial and residual deformation, elasticity, firmness, juice yield, TSS, pH, TA, total anthocyanin content, and for each control: weight loss and physiological disorders (chilling injury and aging). The selections showed significant variability regarding the physiological disorders, especially at T60+7 with a range of 0.0–0.6 for chilling injury index and a range of values of 0–63% for aging. At T60+7 the weight loss range was between 10.0–14.3%. Regarding overall qualitative parameters, relevant changes were observed for firmness which decreased during the storage, with values ranging from 2.58–5.28 (T0) to 2.56–4.41 (T60+7), and for the anthocyanins which increased from a range of 1.67–39.71 (T0) to 30.47–114.86 mg/L (T60+7), with different values depending on the clonal selections. Based on our results, the clonal selections that showed a better aptitude to long-period cold storage were Gangi, 2B-12-9, Pedalino and Amantea, together with the reference cultivars Meli and Messina. These clones resulted particularly tolerant to chilling injury and aging, they maintained the firmness and the most relevant qualitative traits (TSS and TA) and showed the best fruit external appearance after one week of shelf-life (T60+7).