

camera was fixed at the center top of a closed polystyrene box (50x50x50cm), internal walls covered with white paper. Two 20WPL lamps illuminate the mango at the center bottom of the box. Top view picture of the fruit, at rest, was taken. An off-line Matlab™ software calculated the top area of the fruits using a new threshold value $y=x+x(m/k)$, where x : Otsu's threshold; m : mean intensity of the image previously segmented using Otsu's algorithm; k : empirical constant ($=1500$), ambient light dependent. All the fruits were weighted using a digital scale (5kg max., 1g acc.) and the first group was used to find (area x actual mass) relation: $m(g)=-108.7+0.002649A(\text{pixels}^2)$. The other 50 fruits images were used to validate the equation found. Result showed a highly linear correlation between the top area and the measured masses ($R^2 = 0.96$; $SD = 15.7g$) for the first group. It was possible to estimate, by using the area of the top images, the masses of the mangoes belonging to the second group. The (predicted x actual) mass values shown $R^2 = 0.94$, $SD = 19.8g$. Research is being carried out in order to improve the grading system on a conveyor belt, indicating also the possible use with other fruits or horticultural products.

502.490

The Research on Determination of Suitable Table Grape Cultivars for Handling and Storage

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The berry detachment force and resistance to crushing of important forty-five table grape cultivars determined in consecutive three years trials. The tests were made on fifty berries from each cultivar with specially modified weighing scale. The berry crushing and berry removal forces of Palieri were highest. The other cultivars having strong berry and pedicel attachment were Royal, Danam, Ribol, Cardinal, Ata Sansı cultivars. Ribol, Kozak Siyahı, Kadın Parmağı, Ata Sarısı, Amasya Siyahı cultivars showed high resistance to crushing. According to the detachment force and crushing test results, thirteen cultivars were selected for cold storage trials. Palieri was found the most suitable cultivar for long term storage. The other suitable cultivars for cold storage were Royal, Ribol, Kozak Siyahı, Amasya Siyahı, Müşküle and Gros Vert cultivars.

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Dynamics of Trace Gas Emissions from Avocado under Changing O₂ Levels

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To slow down ripening and senescence very often 1-10 % O₂ levels and up to 10% CO₂ are applied during the storage period. By lowering the O₂ level, aerobic respiration turns gradually into alcoholic fermentation. As result, acetaldehyde and ethanol - the fermentation metabolites are produced and can serve as markers for sub-optimal storage conditions. Ethylene also plays an important role in storage conditions. Since avocado fruit are sensitive to ethylene even at relatively low temperature storage conditions, their storage should benefit by control of ethylene concentrations. This means that a timely monitoring of these compounds is essential to successful marketing. However, their concentrations in storage rooms are normally below the detection limit of the conventional analyzers. On-line measurements of trace gases (acetaldehyde, ethanol and ethylene) released by avocado (cv. Fuerte and Hass) using PTR-MS and laser-based ethylene detection are presented. Returning to aerobic conditions after a period of low O₂ leads to a high upsurge in acetaldehyde release, probably due to the elevated ADH activity which is higher in avocado than in other fruits. This might partially explain the success of short anaerobic treatments in reducing ethylene release. When the O₂ level is stepwise increased the acetaldehyde emission is also showing a stepwise behavior although less pronounced at higher O₂ levels, while the levels of CO₂ and ethanol are virtually not influenced. This indicates that, although O₂ was externally applied at a low level, part of the fruit tissue experiences anaerobic conditions. Ethylene concentrations may need to be reduced to 0.01 μL/L or lower in order to obtain significant

benefit, especially for 'Fuerte' in the storage. The commercial potential of reliable instrumentation other than conventional GC or electrochemical sensors for on-line monitoring the dynamic of acetaldehyde, ethanol and ethylene under different storage conditions is shown.

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Storability of 'Algeria' and 'Golden Nugget' Loquats in Modified Atmosphere Packaging

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Loquat, classified as a non climacteric fruit, has a short postharvest life if not properly handled. Loss of firmness, browning of the skin, bruises and reduction of sugars, together with shriveling and decay are the main causes of spoilage. Modified atmosphere packaging (MAP) reduces weight loss and shriveling in loquats, but can also induce adverse effects, such as browning and hastened reductions of sugars and organic acids. The aim of this work was to assess the impact of a modified atmosphere packaging (MAP) generated by an easy-to-open polylactic acid (a biodegradable polymer) tray on fruit of 'Golden Nugget' and 'Algeria' loquat. About 300 g of fruit of each cultivar was packaged and stored for 5, 10 or 15 days at 5 or 10 °C. At the end of each storage period fruit were transferred for a week to simulated retail conditions (SL) at 20 °C and 60-65% RH. Chemical analyses and visual assessments were carried out at the end of each storage period and the respective week of SL, while in-package gas composition was determined at day interval during the first 6 days of storage and every three days thereafter. The rate of degradation of total soluble solids and titratable acidity was higher in packaged fruit than in un-packaged one and at 10 °C than at 5 °C. Although the lid of the trays was not hermetically sealed, the overall gas transmission rate was drastically reduced, generating an in-package CO₂ partial pressure of 7.25 kPa and 10.33 kPa in fruit stored at 5 and 10 °C, respectively. In contrast, weight loss, browning and overall visual quality in packaged fruit changed negligibly, especially in those stored at 5 °C. Although at the taste analysis packaged fruit showed a lower intensity of sweetness and sourness than un-packaged one, they were better considered than un-packaged one for overall preference.

502.493

Harvesting Stage of 'Green Dwarf' Coconut Fruits for Water Fresh Consume

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This work aimed to evaluate physical alterations of fruits of 'Green Dwarf' coconut variety during its development, as well as the alterations on water quality, occurring between the sixth and eighth months of fruit development, objecting to characterize the proper harvesting stage of fruits destined for the coconut water market. The orchards were located in Paracuru County, Ceará State, Brazil. In March, 2001, newly formed fruit bunches were marked, and evaluated three at a time. The duration were zero, 35, 70, 105, 120, 133, 147, 161, 182, 189, 196, 203, 210, 217, and 224 days. Fruits were evaluated for mass, polar and equatorial diameter, water content, total soluble solids (TSS), soluble sugar (SS) and reducing sugars (RS), titratable acidity (TA), pH, TSS/TA ratio, turbidity, and sensorial analysis. A random sampling design was applied to the experiments with 15 treatments (time) for fruit physical characteristics, 13 for fruit water content and water content/fruit mass ratio, 12 for water quality, and 7 for sensorial analysis. In the two first cases three replicates composed of five fruits, each coming from an experimental unit was analyzed. For the sensorial analysis samples were composed of water from the 15 fruits, and analyzed by 30 panelists (replicates). Fruits from 'Green Dwarf' variety reached full development at six months age, with matura-