Argenta 2006

Chamilpa, Cuernavaca, Morelos, 62210, Mexico; [3]Universidad Autonoma Chapingo, Fitotecnia, Carretera Mexico-Texcoco Km. 38.5, Chapingo., Texcoco, 56230, Mexico; [4]Universidad Autonoma del Estado de Puebla, Universidad 1001. Col. Chamilpa., Cuernavaca, Morelos, 62210, Mexico;

Sapote mamey (*Pouteria sapota*) fruit commercialization to different markets is limited due to the fact that it is a host of the fruit fly (*A. serpentina*), so there is a special interest in generating a quarantine treatment protocol. In the present study, fruits from Jalpa de Mendez, Tabasco, Mexico, were harvested at physiological maturity and divided in two groups: a) fruits treated with hot water (46.1 °C) for 1 h, and b) control fruits, with no hot water treatment. Fruits were then stored at 12 °C for 7, 14, 21, and 28 days. After storage, days to ripening as well as respiration rate, ethylene production, and weight loss were evaluated for 6 days. Pulp color (ligthness, hue angle, and chroma), fruit firmness, total soluble solids and sugars, and total phenols (at the end of storage and 6 days after) were also evaluated. Results show that fruits stored for 0 days ripened in 5.8 days, while fruits stored between 7 and 28 days took between 3.2 and 5.6 days to reach the ripe stage. Considering the storage periods, effective postharvest life was increased between 11 and 32 days. Respiration rate markedly increased in control fruits after 21 days of storage, but no chilling injury symptoms were observed. Hot water treatment did not affect ethylene production, sugar or phenol content, color, and fruit firmness. Total soluble solids and sugars increased as storage period increased and even more after storage, thus suggesting that storage temperature does not stop the ripening process. No significant changes were observed in the color components. Results suggest that the hot water inmersion treatment is an alternative to reach the quarantine protocol (not affecting quality) and when combined with refrigeration could be used to sent fruit to distant places.

(203) Responses of 'Golden Delicious' Apples to 1-MCP Applied in Air and Water

Luiz Argenta*[1], Xuetong Fan[2], James Mattheis[3]
[1]EPAGRI, Experimental Extension of Cacador, 1500, Abilio Franco, Cacador, SC, 89.500-000, Brazil; [2]USDA–ARS, ERRC, Wyndmoor, PA, 19038; [3]USDA–ARS, TFRL, Wenatchee, WA, 98801

The efficacy of the ethylene action inhibitor 1-methylcyclopropene (1-MCP) applied in water to slow ripening of 'Golden Delicious' [*Malus sylvestris* var. *domestica* (Borkh.) Mansf.] apples was evaluated in comparison with 1-MCP applied as a gas in air. The material was applied by dipping fruit in 1-MCP water solutions (0, 0.03, 0.3 or 3 μM) for 4 min, or by exposing fruit to 1-MCP gas (0, 0.01, 0.1 or 1 $\mu L \cdot L^{-1}$) in air for 12 h. Fruit were held in air at 20 °C for 25 days after treatment or stored at 0.5 °C in air for up to 6 months followed by 7 days in air at 20 °C. Application of 1-MCP in water or air delayed the increase in respiration and ethylene production associated with fruit ripening, and reduced the amount of fruit softening, loss of acidity and change in peel color. Treatments applied in water required a concentration 700-fold higher compared to those applied in air to induce similar physiological responses. Fruit responses to 1-MCP varied with treatment concentration, and the maximum effects were obtained at concentrations of 0.1 or 1 $\mu L \cdot L^{-1}$ in air and 3 μM in water. Peel color change was impacted less than retention of firmness and titratable acidity for some 1-MCP treatments. Treatment with 1-MCP was less effective for slowing peel degreening when treated fruit were stored at 0.5 °C compared to storage at 20 °C. In 1 of the 3 years of this study, fruit treated with 1-MCP and stored in air at 0.5 °C developed a peel disorder typified by a gray-brown discoloration that is unlike other disorders previously reported for this cultivar.

Poster Session 25—Plant Biotechnolgy 1

29 July 2006, 12:00–12:45 p.m.

(280) Temporal and Spatial Expression of *LEAFY* and *TERMINAL FLOWER 1* Homologues in Floral Bud of Japanese Pear and Quince

Tomoya Esumi*, Ryutaro Tao, Keizo Yonemori
Kyoto University, Graduate School of Agriculture, Kitasirakawa-Oiwake-cho Sakyo-ku, Kyoto, Kyoto, 6068502, Japan

Japanese pear (*Pyrus pyrifolia*) and quince (*Cydonia oblonga*), both classified in the subfamily Maloideae, show differences in inflorescence architectures despite of the fact that they are genetically closely related. We previously isolated flowering related genes, *LEAFY* (*LFY*) and *TERMINAL FLOWER 1* (*TFL1*) homologues, from these species and showed that they had two types of homologues for each gene. In this study, we examined the expression pattern of *LFY* and *TFL1* homologues in these species by in situ hybridization and RT-PCR. The floral bud was dissected to small pieces under stereomicroscope; apical meristem, scales/bracts, pith, floral meristem, and inflorescence; and then used for RT-PCR. The *LFY* homologues were expressed in apical meristem and scales/bracts before the floral differentiation in both Japanese pear and quince. After floral differentiation, the expression was observed in floral meristem, scales/bracts and pith in both the species. The *TFL1* homologues were strongly expressed in the apical meristem, but their expression was drastically decreased just before floral differentiation. It is considered that the decrease of expression of *TFL1* homologues is a sign of floral initiation. The expression of *TFL1* homologues was transiently increased at the beginning of floral differentiation in both species. Moreover, one of *TFL1* homologues in Japanese pear was continuously expressed in the inflorescence part in the floral primordia, whereas expression of *TFL1* homologues in quince almost completely disappeared after a solitary floral meristem was initiated. It was suggested that *TFL1* homologues may also be involved in the inflorescence development of Japanese pear.

STABY

(281) Micropropagation of Trifoliate Orange Rootstock (*Poncirus trifoliate* Raf.)

Abdelrahman Al-Wasel*
Qassim University, Plant Production and Protection, College of Agriculture and Vet. Med. Buriedah, Qassim, 81888, Saudia Arabia

In vitro propagation of trifoliate orange rootstock (*Poncirus trifoliat* Raf.) was achieved using axillary buds taken from new flushes of matur trees and then cultured on Murashige and Skoog medium (MS). Th addition of growth regulators [0.5 $mg \cdot L^{-1}$ gibberellic acid (GA_3) or 0. $mg \cdot L^{-1}$ 6-benzyladenine (BA) and 0.1 $mg \cdot L^{-1}$ indol-3-butyric acid (IBA were necessary to promote bud breakage and shoot elongation. Shoo proliferation was induced on MS medium supplemented with variou levels of BA (0.0, 0.5, 1.0, 1.5, and 2.0 $mg \cdot L^{-1}$) and α-naphthalene acet acid (NAA) (0.0, 0.1, and 0.5 $mg \cdot L^{-1}$). Maximal shoot multiplication (9 shoots/explant) and elongation (2.3 cm) occurred on media containir either 1.0 $mg \cdot L^{-1}$ BA alone or with 0.1 $mg \cdot L^{-1}$ NAA. Shoots rooted bett and gave high root number (7.6 roots/shoot) and long roots (5.4 cr when cultured on a liquid MS medium provided by 0.1 $mg \cdot L^{-1}$ NA Rooted shoots were successfully established in soil (≥90%).

(282) Identification of MicroRNAs in Citrus

Jinggui Fang, ChihCheng T. Chao*
University of California-Riverside, Department of Botany and Plant Sciences, Riversi CA, 92521-0124

MicroRNAs (miRNA) are endogenous tiny RNAs (about 22 nucl tides in length) that can play important regulatory roles in plants a animals by targeting mRNAs for cleavage or involved in translatio suppression. Based on the sequence conservation of many miR genes in different plant genomes, it is possible to identify miRNAs citrus. Identification of miRNA is the prerequisite for understand the miRNA function in citrus. Citrus is an important fruit crop in world and the publicly available citrus EST databases are increasi Thirty known miRNAs from *Arabidopsis* were used to search the ci EST databases for miRNA precursors. Nine possible citrus miR sequences were predicted to have fold-back structures. The North results indicated most of the 26 *Arabidopsis* miRNAs are expres ubiquitously in the leaf, young shoot, flower, and root tissues of N Clementine mandarin (*Citrus clementina* Hort. Ex Tan.) and Trifol orange (*Poncirus trifoliata* [L.] Raf.). Some miRNAs accumul preferentially in different tissues.