without 1-MCP was 29.6%. 1-MCP treatment did not have a significant effect on the respiration pattern of fresh-cut tomato slices, but the application of 1-MCP at 5 °C significantly increased the magnitude of the ethylene production peak in fresh-cut tomato slices. 1-MCP treatment reduced the development of watersoaking on fresh-cut tomato slices; and fresh-cut tomato slices with higher initial firmness values showed less watersoaking development during 8 d storage at 5 °C.

(95) 1-Methylcyclopropene Extends Postharvest Quality of Grape Tomato Fruit Harvested at Advanced Ripeness Stages

Muharrem Ergun, Steven Sargent*, Donald Huber

Horticultural Sciences Dept., University of Florida, 1301 Fifield Hall, PO Box 110690, Gainesville, FL, 32611-0690

Grape tomato fruit (*Lycopersicon esculentum* Mill., cv. Santa) harvested at light-red and full-red stages, were randomized into rigid, vented clamshell containers (473 mL volume; n = 20), treated with 1 $\mu L \cdot L^{-1}$-methylcyclopropene (1-MCP) for 24 h at 20 °C and stored at 20 °C. Light-red harvested fruits treated with 1-MCP had 56% lower respiration rate (3.8 mL/kg/h) than untreated fruits on day 1of storage; by day 7 these rates had converged at about 2 mL/kg/h. Ethylene production from light-red harvested tomatoes treated with 1-MPC was 24% lower (2.3 μL/kg/h) than untreated, with rates converging by day 11. For full-red harvested tomatoes, 1-MCP had similar effects on respiration and ethylene production, although convergence occurred earlier, by day 5. Fruit harvested at light-red stage had lower soluble solids content (4.3%) than fruit harvested at full-ripe stage (5.5%). In a second test, full-red harvested tomatoes were treated with several combinations of 1-MCP concentrations ($\mu L \cdot L^{-1}$) and exposure times (h), namely 1/24, 5/6, 5/12, 25/6, 25/12, 50/6 or 50/12, and stored at 20 °C. There were no treatment effects on surface and locular gel hue angle (38 and 57 degrees, respectively), pulp soluble solids content (6.6%), pH (4.3), total titratable acidity (0.65%) or firmness. Marketable life (>15% of fruits soft, decayed and/or shriveled) for untreated and treated tomatoes was 6 and 7 d, respectively. In a third test, full-red harvested tomatoes were treated with 1 $\mu L \cdot L^{-1}$-MCP for 24 h at either 13 or 20 °C, stored for 4 d at 13 °C then transferred to 20 °C to simulate commercial practices. Marketable life for 1-MCP untreated and treated tomatoes was 7 and 8 d, respectively; treatment temperature had no effect.

(96) 1-Methylcyclopropene (MCP) Does Not Influence Physiological Peel Disorder and Decay Development in White 'Marsh' Grapefruit

Huating Dou*[1], Mark Ritenour[2], Shelley Jones[1]

[1]Citrus Research & Education Center, FL Dept. of Citrus, 700 Experiment Station Road, Lake Alfred, FL, 33850, [2]University of Florida, Indian River Research and Education Center, 2199 S. Rock Road, Ft. Pierce, FL, 34945

The effect of MCP on postharvest pitting (PP), chilling injury (CI), and decay development of various citrus cultivars has been studied in our laboratory since 1998. The results of studies using white 'Marsh' grapefruit are presented here. Grapefruit were harvested early, mid and late season and handled under simulated commercial conditions. All storage conditions had 92% RH. Early-season fruit were treated with five different MCP concentrations (0, 5, 50, 500, and 5000 ppb) at 22 °C for 7 hours. Fruit exposed to 5000 ppb MCP and then stored 4 weeks at 22 °C had increased decay compared to the control, but the development of PP was not affected. There was also no effect of MCP on the development of CI on fruit stored at 4 °C for 2 months. Mid-season fruit were exposed to air or air plus 5000 or 10000 ppb MCP for 7 hours at 22 °C. Compared to the control, MCP treatments resulted in no significant differences in decay development or CI when fruit were stored at 4 °C. However, PP was higher in MCP-treated fruit stored at 22 °C compared to the control. In late-season fruit exposed to air or air plus 1000 ppb MCP and then washed and waxed with shellac or carnauba waxes, there were no differences in CI or decay when fruit were stored at 4 °C, and no differences in PP and decay when fruit were stored at 22 °C. Generally, MCP application did not reduce fruit peel disorder incidence.

(97) Comparison of 1-Methylcyclopropene and Controlled Atmosphere for Maintaining Quality of Apples During Refrigerated Storage and Subsequent Marketing

Elizabeth Baldwin*[1], Jinhe Bai[2], James Mattheis[3], Jeffrey Brecht[4]

[1]Citrus & Subtropical Products Laboratory, USDA/ARS, 600 Ave. S N.W., Winter Haven, FL, 33881, [2]Horticulture, University of Florida, 1207 Fifield Hall, University of Florida, Gainesville, FL, 32611, [3]Tree Fruit Research Laboratory, USDA/ARS, 1104 N. Western Ave, Wenatchee, WA, 98801, [4]Horticulture, University of Florida, 1207 Fifield Hall, Gainesville, FL, 32611

Apples ('Gala', 'Delicious', 'Granny Smith', and 'Fuji') +/ pretreatment with 1-methylcyclopropene (1-MCP, 18 h at 0.625 1.0 $\mu L \cdot L^{-1}$) were stored in controlled atmospheres (CA: 1-1.5 kPa O_2 ; 1-2 kPa CO_2) or in regular atmosphere (RA) for up to 8 months at 1 °C. Firmness, titratable acidity (TA), soluble solids (SS), and volatiles analyzed via gas chromatograph (GC), and electronic nose ('Gala' only) were monitored every month directly or after transfer to air at 20 °C for 1 week to simulate marketing conditions. CA and/or 1-MCP + RA treatments delayed ripening and prolonged storage life as indicated by decreasing loss of firmness and TA in all four varieties during storage. CA and/or 1-MCP + RA also slightly decreased the loss of SS for 'Gala' but had no effect on the other varieties. There were differences among treatments for firmness and levels of TA (1-MCP + RA > CA) for 'Gala' , 'Delicious' and 'Granny Smith' apples (especially after transfer of fruit to 20 °C), however, the reverse was found for 'Fuji' . A combination of 1-MCP + CA was best (1-MCP + CA > 1-MCP + RA or CA) for maintaining 'Delicious' firmness and acidity. CA and 1-MCP inhibited 'Gala' volatile production similarly at low temperature, but the effect of 1-MCP was greater at room temperature. Canonical discriminant analysis of electronic nose data separated the storage treatments (1-MCP + CA, 1-MCP + RA, CA, RA), indicating that the volatile profiles were different in fruit from each treatment (confirmed by GC analysis). The differences in volatile profiles by treatment increased with increasing storage time, and especially after transfer to 20 °C. For inhibition of 'Gala' volatile production, 1-MCP + CA > 1-MCP + RA or CA. Therefore, 1-MCP + RA was the best treatment for storing 'Gala' apples with minimal loss of volatiles, while maintaining firmness and acidity. The results indicate that the efficacy of 1-MCP and CA in maintaining apple quality factors is variety dependent based on one season's data.

(98) Quality Changes During Refrigerated Storage of Araza Fruit Treated with 1-MCP

Maria Hernandez*[1], Lina Gallego[1], Jaime Barrera[1], Orlando Martinez[2], Juan Pablo Fernandez-Trujillo[3]

[1]Instituto Amazonico de Investigaciones Cientificas SINCHI, , Bogota, 02, Colombia, [2]Genetics Institute, Universidad de los Andes, Carrera 1ENo18-20, Bogota, 02, Colombia, [3]Dept. of Agricultural & Food Engineering, Universidad Politecnica de Cartagena-España, Paseo Alfonso XIII. ETSIA (Edif. Agrónomos). 30203, Cartagena, Murcia, 30203, Spain

Arazá fruit harvested at two maturity stages (green mature and mature) in Caquetá (Colombia) were treated according with manufacturer's instructions with 0 (control in air) or 1000 ppb 1-MCP, either for 1 or 6 hours at 20 °C. The fruit were stored at 10 °C and 90% RH to determine the effect of 1-MCP treatment on quality parameters (weight loss, respiration rate, firmness, skin colour, juiciness, anthracnose, shrivelling and skin scald). Fruit were inspected after 1 or 2 weeks at 10°C with or without a shelf life period (3 days at 20°C and 70% RH). 1-MCP delayed respiration rate and colour changes in green mature fruit treated for 1-hour, although shrivelling and skin scald were unaffected by the treatment. When extending 1-MCP exposure for 6 hours in mature green fruit, the treatment also delayed other ripening associated events as