

one type of in-package SO_2 generator, and two controls were applied to the grapes at their locations. Physical, chemical, and sensory analysis were conducted at 0, 2, 4, and 6 weeks of storage. SO_2 treatment had no effect on color, percentage of soluble solids, or pH during storage. Color changes were not significant among the treatments. Fry were found to have higher SS/TA and scored better on appearance and flavor than the other cvs. Flavor degraded during storage, but remained acceptable for Fry and Granny val cvs. throughout the storage period. Weight losses were significant among treatments. Major weight losses were found in the control without liners. Summit had a higher percentage of decay due to late harvest and washing (wetting) which resulted in a shorter shelf-life. Grapes with a polyethylene liner, but no SO_2 , had more decay than grapes without a liner. SO_2 generators were shown to inhibit decay compared to the controls. Fry and Granny val were firm enough to hold during post-harvest storage.

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THE EFFECTS OF STORAGE TIME AND GAMMA RADIATION ON PHYSICOCHEMICAL AND SENSORY PROPERTIES OF JEWEL SWEET POTATOES.

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The major problems associated with sweet potatoes are sprouting, insects and microbial spoilage. An alternative to chemical control of these damages is gamma radiation. A low dose of gamma radiation can control sprouting, insect and microbial damages.

Jewel sweet potatoes were harvested, cured, stored and treated with gamma radiation (dose rate of 1.0 kGy/h at crate surface) at doses of 0.05, 0.075, 0.10, 0.125 and 0.15 kGy in the ^{60}Co Hot Cell. After radiation, sweet potatoes were stored at 15°C and RH of 80-90%. The roots were examined at two months interval for sprouting, insect damage, microbial damage, physicochemical and sensory properties. Sweet potatoes were baked at 177°C (350°F) for 1 hour and evaluated for color, texture, sweetness, bitterness and overall acceptability. The physicochemical analysis of raw and baked roots examined were shear, total carotenoids, proximate composition, vitamin C, starch, sugars (fructose, glucose, sucrose and maltose) and color ('L', 'a' and 'b'). The GLM of SAS, utilizing RCBD, with gamma radiation doses as treatment and storage time (months) as block was used to analyze the data.

Both control and sweet potatoes irradiated at a dose of 0.05 kGy started sprouting after six months of storage. A dose of 0.075 kGy and above permanently inhibited sprouting throughout the duration of the study. The latter sweet potatoes also had less insect and microbial damages. Low dose gamma radiation had no effect ($P>0.05$) on the ascorbic acid, total carotenoids, starch, sugars (glucose, fructose, sucrose and total), shear values and color ('L', 'a' and 'b') of raw and baked sweet potatoes. Maltose (6.0%) was detected in the baked roots and the effect of radiation on this sugar was not apparent. Ascorbic acid, moisture and starch decreased, whereas, total carotenoids, color ('b') sugars (sucrose, maltose and total) increased ($P<0.05$) with storage time. The sensory evaluation data for the parameters evaluated were not significantly different ($P>0.05$) from the control and gamma irradiated roots. Sweetness and color scores increased with an increase in storage time. Gamma radiation has the potential to enhance the quality of stored Jewel sweet potatoes.

13B-39

ISOLATION AND IDENTIFICATION OF POSTHARVEST ROTS IN FLAME SEEDLESS GRAPES GROWN IN NORTHWEST MEXICO.

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In the last three years, important increases in the table grape crop in Sonora. The main producer in Mexico, caused a drop in prices. Consequently, growers stored part of the crop to regulate offer in national and international markets. However, postharvest rots represents a significant threat. *B. cinerea* is the main postharvest pathogen of the table grapes. In California it is responsible for most of the losses during cold storage. Knowledge of field-born pathogens and their development during storage is essential for developing effective control programs. This is a preliminary assay to determine pathogenicity degree of field inoculum from vineyards in northwest México. The objective was to determine the field-born inoculum with potential to express during transportation and storage of table grapes. Flame Seedless grown in a commercial vineyard on Pesqueira, Sonora were used. Copper and sulphur based chemicals were used in the disease control program during the season against downy and powdery mildew, besides of specific fungicides. Four clusters per box and a total of 100 boxes were stored at 0°C and 85-90% RH, and monitored every week for 10 weeks. Isolates were obtained from affected berries and propagated at 25°C on PDA with 10% tartaric acid. Starting from here, up to six subsequent isolations were done to purify colonies. Mycelium samples were placed on slides and stained with cotton blue for analysis with an optical microscope. Identification was achieved by comparison. Fungal colonies developed during cold storage (0°C, 85-90% RH), but only after 35 days. Afterwards, rots continued to develop. Samples were identified as species of *Aspergillus*, *Cladosporium*, *Penicillium* and *Rhizopus*. It was not possible to isolate *B. cinerea* in this assay. Possibly, desert arid conditions with low relative humidity did not favor *B. cinerea* infection.

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ACTIVITY OF 'JONAGORED' APPLE POLYPHENOLOXIDASE (PPO) STORED IN CONTROLLED ATMOSPHERE

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Colour was found to be the critical quality parameter limiting the shelf-life of minimally processed apple (cv. Jonagored) stored in controlled atmosphere (CA).

Polyphenoloxidase (PPO) activity has been extensively reported as the main factor involved on apple browning. An understanding of the specific enzyme is necessary if a more effective means of controlling the enzymatic browning is to be achieved, or if a better understanding of the browning mechanisms under the specific storage conditions is required.

The objective of this study was to elucidate the mechanism by which controlled atmosphere, in particular, carbon dioxide, affects PPO activity, aiming to establish a relationship between the surface browning of cut apple stored in CA and PPO activity. Minimally processed apple was stored under different CA storage conditions (2% O_2 + variable CO_2 , between 4 and 12%) at 4°C during 7 days. PPO activity was determined periodically during storage, by measuring the increase in absorbance at 420 nm using catechol as substrate. Higher values of CO_2 (12%) in the storage atmosphere determined reduced PPO activity. Nevertheless, persistent apple surface browning still occurred.

13C-1

RELATIONSHIP OF VOLATILE COMPOUNDS TO THE SENSORY ATTRIBUTES OF THREE CULTIVARS OF STRAWBERRY JUICE

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Strawberry products such as juice, suffer from color and flavor degradation. Much research has been done on color degradation, but relatively little information exists concerning change in aroma volatiles and sensory characteristics during storage. The objectives of this research were to measure sensory changes in strawberry juice during storage and correlate these changes to important volatiles.

Strawberries from three cultivars (OSO Grande, Sweet Charlie, Selva) were processed into juice, pasteurized at 90°C and filled into 10 ounce glass bottles. Juices were stored at 2°C and 24°C for 0, 2, 4, 6, and 10 weeks. Juices were evaluated for sensory attributes by 11 panelists trained in quantitative descriptive analysis. The attributes fresh, jam, off, green, and sweet were rated on a scale of 1 to 15. Fourteen juice volatiles were also measured using gas chromatography and headspace solid phase micro extraction.

Panelists initially rated the three cultivars equal for all attributes. Fresh flavor declined from an average initial score of 6.7 to approximately 5 and 2.5 for juice stored cold and warm, respectively. Off flavor increased from average initial ratings of 2.2 to 3.5 and 7.5 for juice stored cold and warm, respectively. Jam, green, and sweet attributes did not change during storage. Temperature and time rather than cultivar were more important in determining flavor changes.

Fourteen volatiles were analyzed with three decreasing slightly, one decreasing moderately, eight remaining constant, and one increasing slightly during storage. Volatiles were found to explain approximately 50 percent of the sensory variation by using an adjusted R-squared variable selection-regression model. The strawberry "characterizing" compound, 2,5-dimethyl-4-hydroxy-3 (2H)-furanone, decreased moderately and was statistically associated with all sensory attributes.

13C-2

CHARACTERIZATION OF VIDALIA ONION FLAVOR AND GLC PROFILE CHANGES DURING MAP STORAGE

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Consumer acceptability of onions (*Allium cepa* L.) is influenced by flavor quality. Preference for traits contributing to flavor depends on cultural demand and intended use. While many areas of the world prefer pungent onions, demand for mild, sweet onions has grown in the United States, Europe and Japan. "Sweet" onions are somewhat of a misnomer as they are characterized by an absence of pungency. The pungent compounds apparently mask the sweet taste of the sugars present. The Vidalia onion, one of the more popular types of sweet onion, is grown southeast Georgia. Its mild flavor has been attributed to the low-sulfur soils of the area. To date there has been no published characterization of flavor volatiles from so-called Vidalia type sweet onions.

Purge and trap thermal desorption (P&T-TD) dynamic headspace gas chromatography is one of the most commonly used analytical techniques currently available for the investigation of complex food and flavor systems. The objective of this study was to use P&T-TD dynamic headspace gas chromatography (GC) to differentiate the pattern of volatile flavor compounds in Vidalia onions from more pungent onion types and to trace volatile flavor changes in fresh diced onions during modified atmosphere package (MAP) storage.

Volatile compounds were isolated from onions and analyzed by GC and GC-MS. Vidalia onions had dramatically lower levels of two compounds tentatively identified as dimethyl disulfide and 2-methyl-2-pentenal compounds than those of more pungent onions. A 3 × 3 factorial design was used to conduct the storage experiment involving temperatures and MAP materials. Flavor pattern changes were