TECHNICAL PROGRAMME AND ABSTRACTS

International Society for Horticultural Science (ISHS)

Third International Conference on Postharvest and Quality Management of Horticultural Products of Interest in the Tropics.

"Postharvest technological initiatives to improve food security and market access"

July 1-5, 2013. Hyatt Hotel, Port of Spain Trinidad.

http://sta.uwi.edu/conferences/13/postharvest/References.asp

SUNDAY 30th JUNE 2013

9:00am – 5:00pm	Registration, setting up posters, ISHS Board Meeting
6:00pm – 9:00pm	Opening Ceremony Welcome Remarks (Prof. Margrethe Serek (ISHS Commission on Quality and Postharvest Horticulture)

MONDAY 1ST JULY 2013

7:30 – 9:15 am	Registration
9:15 – 10:15am	Professor C. Sankat's feature address
10:30–11:00am	COFFEE BREAK
	POSTHARVEST LOSSES AND PRE-HARVEST EFFECTS Regency Room #2 **Moderator: Dr. Lynda Wickham** ***Regency Room #2***
11:00–11:30 am	***Keynote address***: Reduction of perishable food losses: Integrating concepts from farm to table. Professor Jorge Fonseca, FAO Postharvest Scientist.
11:30-11:45am	Auroria: Good Horticultural practices for reducing postharvest losses and enhancing quality of vegetables. Dr. H. Ramirez- Guarrero, J.C. Moyeja-Guarrero and S. Mitra.
11:45–12:00pm	Determinants of vase life in *Anthurium andraeanum* Hort**.** Dr. W. Elibox and Prof. P. Umaharan, Department of Life Sciences, Faculty of Science

	and Technology, The University of the West Indies, Trinidad
12:15-12:30pm	Variations of reducing and total sugars in bulb onion tissues during growing and bulbing stages. Ms. S. Steen and Prof. N. Benkeblia.
12:30-12:45pm	Building a quality niche for Caribbean hot peppers. S. M. Moses and Prof. P. Umaharan, Life Sciences Department, Faculty of Science and Technology University of the West Indies, Trinidad.
12:45-1:00pm	DISCUSSION
1:00-2:00pm	BUFFET LUNCH

PRE-HARVEST EFFECTS
Moderator: Dr. Rohanie Maharaj

2:00-2:15pm	Effects of curing treatments on physico-chemical and sensory quality attributes of three pumpkin cultivars. Dr. M. Mohammed, Dr. W. Isaac, Ms. N. Mark and L. Solomon.
2:15-2:30pm	Influence of growth media, cultivars and harvest times on postharvest quality attributes of seven tomato cultivars grown under tropical greenhouse conditions. Mr. J. James, Dr. M. Mohammed, Dr. W. Isaac, Ms. N. Mark and Mr. L. Solomon.
2:30-2:45pm	Breeding multi-purpose hot peppers for increased capsaicinoid content. Dr. Musa Mohamed and Dr. P. Bridgemohan.
2:45–3:00pm	Rapid qualitative assessment methodology to determine postharvest levels of capsaicinoids content in ornamental hot pepper crosses. Dr. Musa Mohamed and Dr. Puran Bridgemohan.
3:00-3:15pm	Postharvest quality and nutrient composition of sweet pepper (*Capsicum annum*) cultivated in different growing media and fertigation. Dr. G. Eudoxie Mr. M. Martin and Dr. M. Mohammed.
3:15-3:30pm	DISCUSSION
3:30-4:00pm	COFFEE BREAK

MATURATION INDICES
Moderator: Professor Nourredine Benkeblia

4:00pm – 4:15pm	Correlation of skin colour, firmness, dry matter and maturity of mango cv. East Indian.Mr. B. Diop and Prof. N. Benkeblia.

4:15pm – 4:30pm	Relationship between skin colour, aril and firmness and dry matter and maturity of ackee fruits. Mr. M. Emmanuel Prof. N. Benkeblia.
4:30pm – 4:45pm	Horticultural maturity indices of breadnut Dr. M. Mohammed and Dr. L. Wickham.
4:45pm – 5:30pm	DISCUSSION/ SUMMARY/ POSTER SESSION
6:00pm – 9:00pm	**Shuttle Service to UWI Principal's Reception**

TUESDAY 2ND JULY 2013
Symposium on Postharvest Logistic Systems for Horticultural Commodities in Latin America and the Caribbean
Moderator: Dr. L. Roberts-Nkrumah
Regency Room #2

8:30-9:00am	Assessment of food logistics in fivecountries in Central and South America. Prof. J. Fonseca, FAO Postharvest Specialist.
9:00-9:30am	Postharvest logistic management strategies in Jamaica. Prof. N. Benkeblia.
9:30-10:00am	Postharvest logistics management strategies in Trinidad and Tobago. Dr. G. Seepersad, Dr. A. Iton and Mr. N. Felix.
10:00-10:15am	A model for postharvest extension in the Caribbean. Dr. W. Ganpat.
10:45–– 11:30am	**PANEL DISCUSSION ON POSTHARVEST LOGISTICS** **Panelists: Professor Jorge Fonseca, Professor Nourredine Benkeblia. Dr. Govind Seepersad, Dr. Ardon Iton, Mr. N.Felix and Dr. W. Ganpat**

RIPENING AND SENESCENCE
Moderator: Dr. Puran Bridgemohan

11:30–11.45am	Investigating of some maturity and ripening parameters of West Indian cherry. Mr. R. Richards and Prof. N. Benkeblia.
11:45–12:00pm	Postharvest physiological changes in tomato. Dr. P. Jeyakumar.
12:00–12:15pm	Postharvest quality of vine-ripe greenhouse tomato cultivars grown in two types of media Ms. N. Mark, Dr. M. Mohammed, Dr. W. Isaac and L. Solomon.
12:15 -12:30 pm	Cultivar differences in the incidence of fruit rots in breadfruit, Dr. L. Roberts-Nkrumah and Mr. O. Daley.

12:30–1:00pm	DISCUSSION
1:00 - 2:00pm	LUNCH

ETHYLENE ANTAGONISTS AND POSTHARVEST TREATMENTS
Moderator: Dr. Reynold Stone

2:00-2:30 pm	***Keynote address***: Derivatives of 1-MCP interacting with ethylene receptor in plants. Professor M. Serek.
2:30–2:45pm	Effect of refrigeration and packages with ethylene absorbents on postharvest quality of dwarf bananas cv. Bananito. Dr. A. O. Herrera, Dr. H. E. Balaguera, Dr. J.C. Garcia and Dr. F. A. Salamanca.
2:45-3:00pm	Effects of postharvest dips on quality and level of decay of mango fruits in storage in Yola Nigeria. Dr. V.T. Tame, Dr. T.V. Gungula and Dr. I.I. Yarkwan.
3:00–3:15 pm	Conservation of mangoes cv. Palmer treated with UV-C radiation in association with coatings after their transference to environmental conditions. Prof. J. Durigan, Brazil
3:15– 3:30 pm	DISCUSSION
3:30 –4:00pm	COFFEE BREAK

Moderator: Dr. Wayne Ganpat

4:00 – 4:15pm	Studies on preparation and preservation of value-added kinnow-aonia ready to serve. Prof. B. Vickram, Mr. D.V. Persad, V. Bahadur.
4:15– 4:30pm	Evaluation of decoction extracts of two types of sour-sop for annonaceous acetogenin. Dr. P. Bridgemohan and Mr. R.S.H. Bridgemohan.
4:30 – 4:45pm	In-vitro evaluation of anti-microbial activity of crude extracts of *Pimentia dioica* Mr. F. Boyd and Prof. N. Benkeblia.
4:45 – 5:00pm	Evaluation of the quality of mangoes cv. Tommy Atkins stored at injury conditions after their transference to the environment using multi-variate analysis. Prof. J. Durigan, Brazil
5:00 – 5:15pm	An assessment of the Caribbean market for pre-packaged vegetables. Dr. A. Iton, Dr. G. Seepersad and Mr. N. Felix
5:15-6:00pm	DISCUSSION AND POSTER DISPLAY

WEDNESDAY 3RD JULY 2013

ALL DAY FIELD TRIP
DEPARTURE FROM HYATT HOTEL AT 9:00AM

FIELD TRIP #1: a. Bundoo's Farm (Production and harvesting)
b. Trinidad and Tobago Agribusiness Association (TTABA) (Postproduction and Marketing)
c. PCS Nitrogen Model Farm (Production, GAPS, Postproduction).

FIELD TRIP #2: a. Institute of Marine Affairs (Aquaculture, Coastal dynamics)
b. Chaguaramas Agricultural Development Programme
c. Botanical Gardens.

FIELD TRIP #3: Sugar Cane Feed Centre (Livestock Production, Biogas Technology, Composting).

THURSDAY 4TH JULY 2013

QUALITY MANAGEMENT OF VALUE-ADDED PRODUCTS

Moderator: Dr. Musa Mohamed
Regency Room #2

8:30-9:00am	***Keynote address***: Value-added products from tropical carbohydrate storage crops and its significance for food security in tropical countries. Dr. Lynda Wickham.
9:00–9:15am	Quality and HACCP-based compliance for primary processing of fine cocoa beans in Trinidad. Dr. R. Maharaj, Mr. M. Ramdawar and K. Kerr.
9:15–9:30am	Comparison between chocolate and an analog product from copoazu. Prof. Cucaita, Prof. R.H. Gutierrez and Prof. M.S. Hernandez.
10:00–10:15am	An assessment of the quality attributes of the Imperial College selections of cocoa lines. Dr. D. Sukha, Dr. S. M. Barath, Ms. N.A. Ali and Prof. P. Umaharan.
10:15-10:30am	A preliminary investigation of the effect of cocoa pulp on final flavor. Ms. N. Ali, Dr. G.S.H. Baccus-Taylor, Dr. D. Sukha, and Prof. P. Umaharan.
10:15–10:45am	DISCUSSION
10:45 -11:15am	COFFEE BREAK

QUALITY MANAGEMENT OF VALUE-ADDED PRODUCTS
Moderator: Dr. Gaius Eudoxie

11:15-11:30am	The impact of processing location and growing environment on flavour in cocoa (*Theobroma cacao* L): Implications of "Terrior and Certification". Dr. D. Sukha, Dr. D. R. Butler, Dr. E.A. Comissiong and Prof. P. Umaharan.
11:30- 11:45am	Utilization of Amazon seje oil extracted by mechanical and manual methods. Prof. Castillo, Dr. M. Lares and Prof. M.S. Hernandez.
11:45-12:00pm	Asai (*Euterpe precatoria*) fruit: harvest and postharvest uses. Prof. M. S.Hernandez, Dr. M. Lares, Dr. M. Carillo, Dr. R.O. Diaz, Prof. R.H. Gutierrez and Dr. J.P. Fernandez-Trujillo.
12:00-12:15pm	Microwave extraction of anti-oxidant compounds from dry copoazu seeds. Prof. Herrera, Prof. R.H. Gutierrez and Prof. M.S. Hernandez.
12:15-12:30pm	Little – used and neglected species from the American tropics: value chain. Prof. M. S. Hernandez.
12:30-1:00pm	DISCUSSION
1:00-2:00pm	LUNCH

METABOLOMICS AND NUTRACEUTICALS
Moderator: Dr. Isaac Bekele

2:00–2:30pm	***Keynote address***: Metabolomics and postharvest science: Challenges and Perspectives. Prof. N. Benkeblia.
2:30–2:45pm	Fruit and vegetable juice blending for developing anti-oxidant rich, nutritious and thirst – quenching health drink. Prof. S. Mitra and Dr. H.O. Ramirez-Guerrero.
2:45-3:00pm	Evaluation of a powdered drink with anti-oxidant properties from asai fruit. Prof Castillo, Dr. M. Lares and M.S. Hernandez.
3:00 -3:30pm	DISCUSSION
3:30-4:00pm	COFFEE BREAK

NUTRACEUTICALS
Moderator: Dr. Govind Seepersad

4:00–4:15pm	Extra- Virgin oil: Physico-chemical parameters in deterioration. Dr. P. Bridgemohan .
4:15–4:30pm	The production of a spray-dried pineapple powder. Dr. S. Mujaffar and Ms.

	G. Ramtahal-Dhun.
4:30-4:45pm	Quality attributes of pumpkin powder via foam-mat drying. Dr. L. Harrynanan and Prof. C. Sankat. University of the West Indies, Trinidad.
4:45-5:00pm	Export potential of Tamil Nadu mangoes to United Kingdom. Mr. A. Siddick and Dr. S. Ganesh.
5:00-5:15pm	Improved handling of fruits and vegetables in Carrefour supermarket in Popoyan, Colombia. Prof. A.D. Palomino, Prof. F. A. Vargas and Prof. C.L. Lopez, Faculty of Agricultural Science, University of Cauca, Colombia.
5:15-5:45pm	DISCUSSION AND CLOSING REMARKS
7:00-11:00pm	BANQUET AND AWARDS CEREMONY

POSTERS

Antifungal effect and quality evaluations on whole fresh papaya fruit treated with chitosan-based edible coatings. M. Hernandez-Lopez, L.L. Barrera-Necha, S. Bautista-Banos, M. Rufina-Diaz, D. Guillen- Sanchez.

Antioxidant capacity in microencapsulated dehydrated Amazonian fruits. M.S. Hernandez, J. E. C. Cardona , R. O. Diaz, M. Carillo, R.H. Gutierrez and J. P. Fernandez-Trujillo.

Consumer perception and willingness to pay for slow food. G. Seepersad, A. Iton and N. Felix.

Impact of physico-chemical quality attributes of breadnut fruit harvested at different stages of maturity on post-cooking quality. M. Mohammed

Quality changes in cocoa liqueur made from infused beans with or without spices and pulp. A. A. John, D. Sukha, L.D. Wickham and M. Mohammed.

Compositional changes in breadnut fruit during ripening. M. Mohammed and L. D. Wickham.

Formulation and assessment of selective physico-chemical, microbiological, nutritional and sensory properties of three snack bars. S. A. Onfry, L. D Wickham, L. and M. Mohammed.

Influence of growth media, cultivars and harvest times on postharvest quality attributes of seven tomato cultivars grown under tropical greenhouse conditions. J. James M. Mohammed, W. Isaac, N. Mark and L. Solomon.

Temperature conditioning and modified atmosphere packaging to alleviate chilling injury in okra D. Alexander, Department of Food Production, Faculty of Food and Agriculture, The University of the West Indies, Trinidad.

Postharvest quality changes in fresh-cut miniature golden apple fruits stored under refrigerated conditions. Z. Holder, Department of Food Production, Faculty of Food and Agriculture, University of the West Indies, Trinidad.

Postharvest management: A Key Factor in Assuring Quality of Fresh Fruits and Vegetables in Tobago's Tourism Industry. S. Williams-Timothy, Marketing Division, Tobago House of Assembly, Scarborough, Tobago.

ABSTRACTS

Influence of growth media, cultivars and harvest times on postharvest quality of selected tomato cultivars grown under tropical greenhouse conditions.

J. James, K. Campo, W. Isaac, M. Mohammed, N. Mark and L. Solomon
Department of Food Production, Faculty of Food and Agriculture, The University of the West Indies, Trinidad.

One of the major concerns regarding tropical protected structures is their ability to generate high marketable quality, with respect to being affected by variables such as heightened atmospheric temperature and extreme fluctuations in relative humidity. This study focussed on marketable quality of seven tomato cultivars grown in two coconut coir media containing sharp sand and grown under tropical greenhouse conditions. Cultivars IT71 (75.7 g/fruit) and Versatile (45.7 g/fruit) planted in coconut coir generally accounted for significantly higher yields. The highest number of marketable fruits was observed in varieties IT71 (54) and Hybrid 61 (43), grown in coconut coir. Hybrid 61 had the greatest stability across both media. Extensive pre- and postharvest physiological fruit defects (fruit cracking, grey mold, blossom end rot (BER) and shrivelling) were noticeable in both media, with significantly higher losses occurring in cultivars grown in sharp sand. BER and fruit cracking accounted for the highest defects in cv. Striker and cv. Versatile respectively. Cultivar IT71 had the least fruit defects. Further research on pre-harvest and post-harvest management strategies is necessary in order to curtail such defects.

Postharvest quality and nutrient composition of sweet pepper (*Capsicum annum* L) cultivated in different growing media and fertigation

G. Eudoxie, M. Martin and M. Mohammed
Department of Food Production, Faculty of Food and Agriculture, UWI, St. Augustine, Trinidad and Tobago

Fruit quality attributes and nutritive value is affected by nutrient availability and uptake, which is influenced by the chemical reactivity of the growing media. A greenhouse trial was conducted investigating four physically and chemically different media (perlite, coco coir, and combinations of perlite with either rice straw compost or spent mushroom substrate (bagasse based)) influence on sweet pepper (Cv. Destra) fruit quality and nutrient content. Total number of fruits per plant, nonmarketable fruit and fruit weight were measured over a 3-month production period. Three fruits per treatment were collected for determination of elemental nutrient content and fruit quality attributes respectively during early harvest. The pH and EC of the growing media were also measured at those stages. Fruit yield was similar across media, but coco coir showed a higher number of non-marketable fruit. Significant differences were seen across media for fruit Ca and K content, in both instances perlite and perlite and spent mushroom substrate resulting in greater concentrations. A strong correlation was seen between Ca content and non-marketable fruit. Fruit quality attributes were not affected by media treatments. The effects of chemically reactive media on physiological disorders and fruit quality should be considered.

Compositional changes of vine- ripe greenhouse tomato cultivars from two types of growth media.

N. Mark, M. Mohammed, W. Isaac, and L. Solomon, Department of Food Production, Faculty of Food and Agriculture, University of the West Indies, St. Augustine Campus, Trinidad.

Studies were conducted to investigate quality attributes of four tomato cultivars (Caraibe, Summerstar, Striker and Hybrid 61) grown in a gable roof greenhouse in two types of media (Spent Mushroom Substrate (SMS) and Coconut Coir (CC) and subsequently stored at 20°C for 10 days. The cultivars were analyzed for yield, colour, firmness, puffiness, number of locules, mesocarp thickness, pH, total soluble solids (TSS), total titratable acidity (TTA) , TSS:TTA and percentage decay-free fruits. The tomato cultivar Hybrid 61 grown in coconut coir had the highest yield without any incidence of decay after 10 days at 20°C. On the other hand tomato cultivar Summerstar grown in both media had the highest incidence of fruit decay. Cultiva Caraibe harvested from coconut coir accounted for the highest firmness among cultivars after 10 days at 20°C. Cultivars Caraibe and Striker grown in SMS had a TSS value of 8.1 and 8.3 respectively and TTA of 152.08mg/100g and 221.2mg/100g respectively. Striker grown in CC had the highest mesocarp thickness (5.95mm) as opposed to Hybrid 61 grown in SMS which had the lowest mesocarp thickness (1.73mm). The study indicates that the physiochemical attributes of tomato cultivars can be affected by the type of media.

Cultivar differences in the incidence of fruit tots in breadfruit

L. Roberts-Nkrumah and O. Daley, Department of Food Production, Faculty of Food and Agriculture, The University of the West Indies.

Breadfruit *(Artocarpus altilis)* is well-recognised as having significant potential as a tropical food crop. However, short shelf life is a significant constraint to availability for greater utilization, and in the Caribbean, postharvest losses have been estimated to be as high as 50%. Several pre-harvest factors, including fruit diseases, reduce fruit quality and marketability at harvest and may also contribute to low post-harvest quality. The presence of fruit rots and other defects was evaluated in breadfruit accessions in a germplasm collection at the University of the West Indies, St. Augustine campus, Trinidad and Tobago over two years. The accessions consisted of cultivars collected from the Caribbean and others imported from the National Tropical Botanic Garden in the USA which were collected of various regions in the Pacific. Differences among cultivars in the percentage ofthe fruit surface affected with fungal damage, and the incidence of fruit cracking were both very highly significant ($P<0.0001$). The seasonal effects on fungal damage, fruit spots and cracking were also very highly significant ($P<0.008$). While other defects among harvested fruits including abnormal shape, immaturity or over maturity were present, there were no significant differences among cultivars. However, cultivars differed ($P<0.0001$) in the percentage of unfit fruits. These results suggest that cultivar selection, crop management and appropriate maturity indices are important strategies for improving post-harvest quality of breadfruit by reducing fruit rots and other defects that can affect shelf-life.

An assessment of the Caribbean market for pre-packaged vegetables

A. Iton, G. Seepersad, and N. Felix
Department of Agricultural Economics and Extension, Faculty of Food and Agriculture,
The University of the West Indies, Trinidad.

Globally, the market for pre-packed convenience foods has been showing an increasing trend. Supermarkets and food manufacturers have been working together to exploit the affluent and increasingly diligent consumers who are running out of time to purchase, prepare, cook and consume their food in traditional ways. Small farmers contribute by far the largest share of agricultural production **in** the Caribbean Region. However, in many Caribbean islands the small farmers, be it crops or livestock, still appear to be struggling to meet their subsistence needs. This paper attempts to identify a growing market segment that small producers in can participate in and contribute to sustainable small scale agriculture: "The Convenience Food Sector (Pre-packed Vegetables)".

Consumer Perception and Willingness to Pay for Slow Food

G. Seepersad, A. Iton and N. Felix
Department of Agricultural Economics and Extension, Faculty of Food and Agriculture, The University of the West Indies, Trinidad.

Globalization has made it easier for food manufactures to supply inexpensive, convenient and unbalanced meals to the general population. These foods, due to their availability have been classed as fast foods, and have been linked to various lifestyle diseases, such as obesity and heart disease. During recent years a movement called Slow Food International, have been attempting to alter food consumption habits, by promoting cleaner foods and sustainable production practices. This paper seeks to assess the perception of "slow food" (traditional food) compared to fast foods in Trinidad and Tobago. This was done by comparing a local (traditionally prepared) dish compared to an imported fast food. Determinants for food selection were accessed using the Likert Scale and then ranked using Point Score analysis. The factors which influenced consumers' willingness to pay (WTP) for these food items were further analysed using Logistic regression. The results of this study show a high preference for Slow Food in Trinidad and Tobago among various the consumer groups.

Formulation and Assessment of Selective Physico-Chemical, Microbiological, Nutritional and Sensory Properties of Three Snack Bars

S. A. Onfry, L. D. Wickham, and M. Mohammed
Department of Food Production, Faculty of Food and Agriculture,
University of the West Indies, St. Augustine Campus, Trinidad.

The incorporation of tropical commodities into snack foods presents unlimited potential in the food industry, as they offer naturally occurring nutrients which may aid in improving the health of consumers. Accordingly, this research investigation was undertaken to develop three snack bars utilizing tropical commodities such as dehydrated pineapples, papayas, bananas, macerated sorrel calyces and sour cherry pulp, and coconut. The aforementioned and all other ingredients remained constant while the amount of coconut used varied at 0% (snack bar 1), 10% (snack bar

2) and 20% (snack bar 3). Snack bars 1, 2 and 3 were analyzed to determine some of their physico-chemical, microbiological and nutritional properties. A series of sensory evaluation sessions were also conducted. As such, there were varying amounts of protein, fat, dietary fiber and minerals such as calcium, iron, zinc, sodium and potassium, present in snack bars 1, 2 and 3; with snack bars 2 and 3 having a higher amount of dietary fiber and protein than snack bar 1. There were also significant differences between snack bars 1, 2 and 3 with respect to colour (snack bar 2 was darker in colour than snack bars 1 and 3), pH and degrees Brix. However, all snack bars had an acidic pH. There was also variability in the hardness of the snack bars during the storage period. No microbial growth (10cfu/g) was observed in any of the snack bars during this investigation. Sensory panelists found snack bars 1 and 2 to be more acceptable than snack bar 3 with respect to appearance, colour, flavour, aroma, taste and texture. The snack bars containing the least amount of coconut may be a lucrative product development venture and thus presents great potential for the development of snack bars, utilizing readily available tropical commodities.

Temperature conditioning and modified atmosphere packaging to alleviate chilling injury in okra

D. Alexander, Department of Food Production, Faculty of Food and Agriculture, The University of the West Indies, Trinidad.

This study involved methods to alleviate chilling injury in okra using temperature conditioning and modified atmosphere packaging techniques. Fruit samples were packaged in low density polyethylene (LDPE) and high density polyethylene bags (HDPE) bags and stored at 6 - 7 ^{0}C and 20 – 22 ^{0}C up to 12 days. Chilling injury was reduced when okra fruits were stored at 6-7 ^{0}C, in LDPE bags for up to eight days. Chilling injury symptoms became visible when fruits were stored beyond 8 days regardless of the type of package used.

Postharvest management: A Key Factor in Assuring Quality of Fresh Fruits and Vegetables in Tobago's Tourism Industry

S. Williams-Timothy, Marketing Division, Tobago House of Assembly, Scarborough, Tobago

This paper examined postharvest management as it relates to quality changes of fresh fruits and vegetables quality destined for the tourist industry in Tobago and offers recommendations for improvement. Fresh produce quality was examined at six leading hotels on the island. The tourism industry is vital to the mainstay of the island's economy. In Tobago it is the second largest employer after the government (Tobago House of Assembly). Visitors come to the island for various reasons, but there is one common factor, which is, the need for food. Food quality therefore is a major aspect of Tobago's tourism sector, a fact that is often understated. Good quality of fresh produce provides taste and nutrition along with visual appeal; attributes which are expected by visitors. The quality of fresh produce in the hotels that were studied was inconsistent. The main vegetables that displayed poor quality were: pacthoi, lettuce, cabbage, bhagi, dasheen leaves and green herbs and these were associated with chlorophyll breakdown leading to senescence, butt end dark discolouration, torn petioles, shrivelling or wilting and bacterial breakdown. Poor quality was highest in commodities coming from Trinidad. Symptoms of heat stress, over-maturity, ethylene damage and mechanical damage were identified among

fruits such as mangoes, papaya, plantains, citrus and pineapples and fruit-type vegetables such as tomatoes, cucumbers, melongenes, okra and sweet peppers. The manifestation of these symptoms include: wilting, russet spotting, internal breakdown, heat injury, abrasions and compression damages that often lead to secondary infections. There is the need to manage quality in a centralised packinghouse and incorporate defined grades and standards and proper packaging techniques to enhance quality and reduce postharvest losses.

Postharvest quality changes in fresh-cut miniature golden apple fruits stored under refrigerated conditions

Z. Holder, Department of Food Production, Faculty of Food and Agriculture, University of the West Indies, Trinidad.

Mature green miniature golden apple fruits were stored uncut or whole and as fresh-cut into quarters with the skin and seeds intact and stretched-wrapper in polystyrofoam trays and stored at 4-5C, 10-12C and 20-22C up to 21 days and evaluated for percentage fresh weight losses, internal and external colour, firmness, total soluble solids, total titratable acidity, pH, vitamin C and percentages marketable and decay-free samples. Throughout storage particularly at 10-12C and 20-22C whole fruits maintained better quality compared to fresh-cut fruits. Inception of fungal decay in fresh-cut fruits became more visible at the higher temperatures. However chilling injury symptoms was noted for whole fruits stored at 4-5C as early as 5 days and progressed more as storage duration increased to 21 days. Fresh-cut fruits had less chilling injury symptoms at 4-5C but desiccation was apparent after 8 days. Stretch-wrapping of fresh-cut golden apple fruits and storage at 4-5C is a viable option providing moisture loss is curtailed to a minimum.