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tropical fruit net

Your Global Partner in Tropical Fruit Development

Newsletter of the International Tropical Fruits Network (TFNet)

May-Aug 2012

5th ISTSF successfully held in Guangzhou, China



The 5th International Symposium on Tropical and Subtropical Fruits (ISTSF) was held in Guangzhou, China on 18-20 June 2012. It was jointly organized by Institute of Fruit Tree Research, Guangdong Academy of Agricultural Sciences (IFTR-GDAAS); International Tropical Fruits Network (TFNet); International Society for Horticultural Sciences (ISHS); Hunan Agricultural University; and Guangdong Fruit Association.

A total of 230 participants from 23 countries attended the symposium, including those from Australia, Bangladesh, Brazil, China, Fiji, Italy, Malaysia, Sudan, Thailand, and USA. Participants hail from renowned academic and research institutions, international organizations, government agencies and the private sector.

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Fruit prices (Vietnam), 1st week June 2012

#	Fruit	Farm gate	Wholesale
1	Dragon fruit	0.45-0.55	0.55-0.65
2	Durian	0.90-1.00	1.00-1.10
3	Guava	0.30-0.40	0.40-0.50
4	Jackfruit	0.50-0.60	0.60-0.70
5	Longan	0.95-1.00	1.10-1.20
6	Lychee	0.55-0.60	0.65-0.70
7	Mango (Cat Hoa Loc)	1.40-1.50	1.55-1.65
8	Mangosteen	1.50-1.65	1.70-1.90
9	Papaya	0.08-0.10	0.13-0.18
10	Pineapple	0.13-0.20	0.20-0.23
11	Pomelo (5 Roi)	0.45-0.50	0.50-0.55
12	Pomelo (Da xanh)	1.40-1.50	1.50-1.65
13	Rambutan	0.75-0.80	0.90-0.95
14	Sapodilla	0.45-0.50	0.55-0.65
15	Watermelon	0.25-0.30	0.30-0.35

Unit: USD/kg

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TFNet successfully held two major events for this year – the 5th International Symposium of Tropical and Subtropical Fruits on 18-20 June and the TFNet 5th General Assembly on 21 June at Guangzhou, China. During the General Assembly, Malaysia retained the Chairperson post in the Board of Trustees.

This issue also reports on the 7th International Post Harvest Symposium held in Malaysia from 25 – 29 June, which TFNet was involved as a coorganizer.

Vietnam is one of the leading Asian countries in the production of tropical fruits. The annual southern fruit festival began with an official opening on June 1 in Ho Chi Minh City. The festival was well supported by the Government agencies, research institutions and the private sector. A report on the festival is included in this issue.

The jackfruit - a popular fruit consumed either fresh or cooked in most Asian countries, is featured as the fruit focus for this issue. The trend of marketing jackfruit as a minimally processed products and the challenge to mitigate diseases which can impact production, such as fruit rot is also discussed.

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- The Syrian Arab Republic
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FIRST ANNOUNCEMENT

5th INTERNATIONAL SYMPOSIUM FOR THE DEVELOPMENT OF INTEGRATED PEST MANAGEMENT FOR SUSTAINABLE AGRICULTURE IN ASIA AND AFRICA (5th IPM)

IPM : New Frontier Towards Sustainable Agro Ecosystem

- 18 – 20 December 2012
- Sutera Harbour Resort
Kota Kinabalu, Sabah,
Malaysia

ipm.mardi.gov.my

Organizers:  

Co-organizers:   

Supported by: 

The 5th International Symposium for the Development of Integrated Pest Management for Sustainable Agriculture in Asia and Africa (5th IPM) will be held on 18-20 December 2012 at the Sutera Harbour Resort, Kota Kinabalu, Malaysia.

The 5th IPM is organized by Malaysian Agricultural Research and Development Institute (MARDI) and Niigata University. Co-organizers are the International Tropical Fruits Network (TFNet), Universiti Malaysia Sabah, and the Malaysian Cocoa Board. It is also supported by the Malaysian Ministry of Agriculture.

Bearing the theme "IPM: New Frontier Towards Sustainable Agro Ecosystem," the Symposium will feature sessions on biocontrol, biopesticides,

ecological engineering, plant host resistance in IPM, biotechnology and biodiversity, organic farming and soil health, and advancement and innovation in IPM Programme. The Symposium is open for policy makers, entrepreneurs, farm managers, extension agents, academicians, researchers, and students.

Interested parties are invited to contribute oral or poster presentations. Authors are required to submit an extended abstract with the following parts: shorts abstract, introduction, materials and methods, results and discussion, and references. Submissions should be in MS Word format, A4 paper, size 12 Times New Roman, and single spaced. The official language is English. Entries can be emailed to roff@mardi.gov.my on or before 30 October 2012. Meanwhile, posters

should be in portrait size of A1 (508mm x 762mm) and must be legible 1m away.

Registrations fees cost MYR 800 for local participants and MYR 500 for local students, while USD 700 for international participants and USD 350 for international students. Booth rental in the exhibit area is MYR 3,000. Advertisements for the programme book are also open.

General enquiries can be sent to:
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The 1st International Symposium on Jackfruit and other Moraceae will be held on 18-20 November 2012 at the Bangladesh Agricultural University (BAU), Mymensingh, Bangladesh.

Bearing the theme “Jackfruit for Nutritional Food Security and Poverty Reduction,” the symposium will cover topics on production, improvement of yield through development of new varieties, pests and their management, pest and their management, improvement of quality during production,

minimizing postharvest losses, and marketing.

It will also provide an international platform to discuss the emerging issues, problems, and threats for cultivation of jackfruit and other Moraceae under climate change. This aims to ensure continued production, leading to food security and poverty reduction of marginal farmers in developing countries.

Interested participants are welcome to submit abstracts for oral or poster presentations.

This symposium is organized by the International Society for Horticultural Science, BAU-Germplasm Centre, Fruit Science Society of Bangladesh, Seed Science Society of Bangladesh, and International Tropical Fruits Network (TFNet).

For more information, kindly contact Prof. Dr. Md. Abdul Kader at n_sparkle_04@yahoo.com or makader69@hotmail.com

Related Events

2012 International Citrus Congress

Focus: Citrus and health

Date: 18-23 November 2012

Venue: Valencia, Spain

Website: <http://www.citruscongress2012.org>

Lychee Symposium 2012

Focus: Lychee, Longan and Other *Sapindaceae* Fruits

Date: 2-6 December 2012

Venue: White River, South Africa

Website: <http://www.lychee2012.com>

V International Symposium on Human Health Effects of Fruits and Vegetables

Focus: Healthy Eating

Date: 7-11 January 2013

Venue: Kharnataka, India

Website: <http://www.favhealth2012.org>

International Conference on Agricultural Engineering

Focus: New Technologies for Sustainable Agricultural Production and Food Security

Date: 24-26 February 2013

Venue: Muscat, Oman

Website: <http://www.agengineeringconf.com/>

Pomology Course - University of California Davis

Focus: Orchard Management and Business Decisions

Date: 25 February - 7 March 2013

Venue: California, USA

Website: <http://fruitandnuteducation.ucdavis.edu/>

X International Mango Symposium

Date: 3-7 June 2013

Venue: Dominican Republic

Email: xmango2013@gmail.com

The 5th International Tropical Fruits Network General Assembly 第五届国际热带水果组织全体会议



TFNet holds its 5th General Assembly in Guangzhou, China

The Fifth General Assembly (GA) of the International Tropical Fruits Network (TFNet) was held in Guangzhou, China on 21 June 2012, a day after the 5th International Symposium on Tropical and Subtropical Fruits.

Eight country members, 2 associate members, 2 expert members and 10 observers attended the Assembly. Observers include representatives from the Afro-Asian Rural Development Organisation (AARDO), Common Fund for Commodities (CFC), Inter-American Institute for Cooperation on Agriculture (IICA) and the Fijian Ambassador to China. Senior Economist Kaisong Chang represented the Food and Agriculture Organisation (FAO) of the United Nations. The TFNet Secretariat provided support and documentation for the Assembly.

The General Assembly was officiated by the Honourable Long Xi from the Chinese Ministry of Agriculture in Beijing. As the representative of the host country, Dr. Yi Ganjun was introduced as Chairperson of the GA. The Vice Chairpersons of the assembly were Malaysian representative HE Dato' Mohd Hashim Abdullah and Fijian Ambassador to China HE EsalaTeleni.

TFNet CEO Yacob Ahmad presented the 2009-2012 progress report, opening up the discussion on issues ranging from increasing membership, financial sustainability, corporate communication, products and services, capacity building and the strategic direction for 2012-2015.

In the election of new TFNet Board of Trustees (BOT) for 2012-2015, Malaysia retained the Chairperson position, while China

and Vietnam were elected as Vice Chairpersons respectively.

With the adoption of constitutional amendments, all the 12 representatives of Country members are, by default, members of the Board.

The two internal auditors elected were Australian representative Bob Williams and Sudanese representative Dr. Badreldin Elshiekh Mohamed Elhassan.

During the first session of the TFNet Board of Trustees (2012-2015) meeting after the General Assembly, the representative from Vietnam proposed that the Board meeting for 2013 to be held in Ho Chi Minh City during the main fruit season.

TFNet Board of Trustees (2012 – 2015)

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Representative of the Government of Philippines

Dr.BadreldinElshiekh Mohamed Elhassan
Representative of the Government Sudan

Mr. Bob Williams
Representative of the Government of Australia

Mr. KV Singh(unable to attend)
Representative of the government of India

Mr. Anwar Faruque (unable to attend)
Representative of the Government of Bangladesh

Mr.MuawyaJaber Abdul Rahman (unable to attend)
Representative of the Government of Syria

Mdm Adenike Olusolape Olufolaji (unable to attend)
Representative of the Government of Nigeria

Dr. Michael Hermann
Crops for the Future, Malaysia

Mr. Cheah Kiu Lye
Sime Darby foods and Beverages Marketing Sdn Bhd,
Malaysia

Prof. Emeritus Dr. Errol W. Hewett
New Zealand

Prof. Dr. Sisir Kumar Mitra
India



► Opening Ceremony



The General Assembly ◀

Malaysia hosts 7th International Postharvest Symposium

The 7th International Postharvest Symposium (7th IPS) was held in the Putra World Trade Center in Kuala Lumpur, Malaysia on 25-29 June 2012.

Bearing the theme “Postharvest for Wealth and Health,” the 7th IPS featured sessions on preharvest effects; physiological and molecular mechanisms; physical and chemical treatments; postharvest pests and diseases; antioxidants, bioactive compounds and health; low temperature storage; CA/MA and minimal processing; omics and physiological disorders; engineering and mechanization; quality, safety and security; handling and packaging; consumers and marketing.

There was a total of oral 147 presenters and 364 poster presenters. Posters were presented both in hardcopy and e-poster formats.

The 7th IPS was jointly organized by the Malaysian Agricultural Research and Development Institute (MARDI), Universiti Putra Malaysia (UPM), and the International Society for Horticultural Science (ISHS) in cooperation with the International Tropical Fruits Network (TFNet)



“The fresh horticultural crops industry is faced with tremendous growth and market demand, both for the local and export markets,” said the Malaysian Deputy Prime Minister HE Tan Sri Dato’ Muhyiddin Mohd. Yassin during the opening ceremony. “Fresh fruits, vegetables, and flowers are highly perishable and need to be properly handled. Postharvest losses translate to human hunger and financial losses,” he added.

“The sharing of knowledge and the successful transfer of postharvest technologies in this Symposium will lead to an increase in productivity, product quality for health enhancement and higher economic returns for farmers and industrial player globally,” said Malaysian Minister of Agriculture and Agro-based Industry HE Datuk Seri Noh Omar.

The keynote papers were “Postharvest for Wealth and Health” by Shoiw Y. Yang, USA,

“Interdisciplinary team-work for providing global citizens with a safe, adequate and healthy diet” by Mark Failla, USA, and “ISHS Commission on Quality and Postharvest Horticulture” by Siricai Kanlayanarat of ISHS.

In addition to the plenary concurrent sessions, workshop sessions were held on postharvest technologies in developing countries with focus varying from managing chilling injury; antioxidants bioactive compounds and health promoting substances, and emerging technologies – from concept to reality.

Posters were presented both in hardcopy and e-poster formats.

A technical tour was held on 27th June 2012 to different places of interest like the Agriculture Heritage Park in Putrajaya, Agriculture Conservatory Park of Universiti Putra Malaysia, MARDI, and Perdana Botanical Garden.



5th ISTSF successfully held in Guangzhou, China (continued from page 1)



A total of 59 oral presentations were delivered on two concurrent sessions. Meanwhile, 40 posters were displayed in the exhibition area. The oral and poster presentations were classified into 6 major topics, which are germplasm, diversity and breeding; molecular biology and biotechnology; production technology and physiology; postharvest and processing technology; pest and disease management; and economics, marketing, and trade.

"The industry of tropical and subtropical fruits has becoming one of the most important pillar industries in producing regions, having a huge market around the world," said GDAAS President Jiang Zongyong during his opening remarks. He added that as diseases and climate change threaten the industry, the symposium provided an avenue for stakeholders to exchange

valuable information.

"The potential for development of tropical and subtropical fruits depends on continuous improvement on technology for production and postharvest management," said ISHS Section on Tropical and Subtropical Fruits Chair Sisir Kumar Mitra. He added that "Global partnerships are imperative to integrate scientific and technological innovation".

Other special guests in the opening ceremony included Malaysian Secretary General for Agriculture HE Dato' Mohd Hashim Abdullah, Liu Yan from the Chinese Ministry of Agriculture, Hunan Agriculture President Zhou Qingming, Cheng Ping from the Guangdong Department of Agriculture Zhong Xiaoping from the Guangdong Department of Science and Technology, and TFNet CEO

Yacob Ahmad. GDAAS Vice President and Convener Yi Ganjun chaired the ceremony.

FAO Senior Economist Kaison Chang chaired the first session that featured keynote papers such as "Challenges and Issues in Developing the Tropical and Subtropical Fruit Industry in China" by Deng Xiuxin, President of Huangzhong Agricultural University, China; "A Systems Approach to Improve Research Outcomes in Tropical Fruit Production and Supply Chains" by Bob Williams, Director of the Australian Department of Plant Industries; "Current Status of Huanglongbing (HLB) in China and Future Control Strategies" by Zhong Guangyan of IFTR-GDAAS; and "Crop Regulation for Tropical Fruit Production" by Sisir Kumar Mitra, Chair of the ISHS Section on Tropical and Subtropical Fruits.



The symposium highlighted recent research and development in production and postharvest fruit technologies; discussed current issues on consumer demand, market access, and trade; provided a forum for information exchange among researchers, producers, academicians, traders, policy makers, and other stakeholders in the tropical and subtropical fruit industry; and established

and strengthened network linkages between the researchers, producers, traders, policy makers and other stakeholders in the tropical and subtropical fruit industry.

In the exhibition booth, TFNet Associate Member Sime Darby Plantation displayed GOFRESH – a line of pink guava juice products. ISHS and TFNet also displayed their materials.

The Symposium included a field trip to a commercial organic banana farm managed by the Zengcheng Xianghui Banana Farmers' Cooperative, the Jiangnan wholesale fruit market, the Baiyun National Agricultural Science and Technology Park of Guangzhou, and the South China Agricultural Research and Innovation Center.



Post-symposium field trip held for 5th ISTSF participants



Participants of the 5th International Symposium on Tropical and Subtropical Fruits (ISTSF) went on a field trip on 18 June 2012, a day after the symposium.

Participants visited the banana plantations of the Zengcheng Xianghui Banana Farmers' Cooperative that was established in 2009. The cooperative focuses from production to the marketing of banana. It has planted more than 200 ha of banana plants, with an annual yield of more than 10,000 tons that sells for about 45,000,000 RMB. About 20 ha are dedicated solely for organic bananas.

Institute of Fruit Tree Research (IFTR) Director Zhong Guangyan showed the banana plants intercropped with Chinese leeks. In their field studies, it is found that Chinese leeks can significantly reduce the incidence of Fusarium Wilt, a disease that threatens the banana incident worldwide.

Participants were divided into two groups. One group visited the Jiangnan wholesale fruit market while the other went to the National Agricultural Science and Technology Park of Guangzhou and the South China Agricultural Research and Innovation Center.

The Jiangnan wholesale market in Guangzhou has grown into the largest in southern China since it was founded in 1994. It is about 400,000 sq. m, with 180,000 sq. m for trading fruits. It currently holds 80% of the fruit trade imports in China. The market provides price information of fruits and vegetables in their website www.jnmarket.net.

Located in the Baiyun District of Guangzhou, the National Agricultural Science and Technology Park is a multifunctional base for research, experiment, demonstration, extension, training, and tourism. It occupies 135 ha, including an aerospace breeding

garden, a plant cloning center, an experimental area for soil-free cultivation and an exhibition hall. It functions as a demonstration site for the modern agriculture techniques and technology of the institutions in Guangdong.

Finally, the South China Agricultural Research and Innovation Center in Guangdong Academy of Agricultural Sciences houses the following 8 research centers: Agricultural Ciological Germplasm Gene Center, Crops Growth Regulation Research Center, Research Center for Quality Safety and Standard of Agricultural Product, Agricultural Resource and Environment Research Center, Animal Science Research Center, Veterinary Public Health Research Center, Farm Produce Processing Research Center, Agricultural Information, and Rural Economy Research Center. Laboratories are open for public viewing.



Vietnam Celebrates Annual Southern Fruit Festival

HO CHI MINH CITY: The 16th Vietnamese Southern Fruit Festival was held at the Suoi Tien Theme Park in District 9, Ho Chi Minh City from 1 – 23 June 2012. The festival was a joint collaboration between the Municipal Department of Culture, Sports and Tourism and the Department of Agriculture and Rural Development. It is an annual affair, organized to celebrate the harvest season of fruits such as mangoes, rambutans, and durians.

The main objectives of this festival were to promote and increase consumption of local tropical fruits among tourists and locals, to provide income for smallholders to traders, to boost the tourism industry, and to provide fruit smallholders and growers an avenue to promote their developed varieties through the fruit competition.

The programme for the festival included a fruit parade during the opening ceremony, sale of the different local fruit varieties in boat shaped stalls, exhibition many rare and underutilized local fruit species,

booths with fruit based processed products and a fruit competition with participants comprising mainly of smallholders.

The festival began with an opening ceremony on June 1 that included cultural performances and parades by Laos, Malaysian, Thailand and Indonesian cultural troupes, in the presence of more than 20 foreign diplomats based in Ho Chi Minh City

The highlight of the festival was a fruit competition that garnered 600 smallholders from 21 provinces, each vying for prizes for the best of 11 fruit types including durian, rambutan, mangosteens, mangoes, pitaya, pomelo and mandarins. The criteria for judging included external appearance, fruit size, shape, percentage of pulp/flesh to skin, ease of opening, sweetness, general taste and minimum residual levels.



Dr. Minh Chau, Director of Southern Fruit Research Institute, acknowledging a recommended mango variety.



Vietnam Southern Fruit Festival, Ho Chi Minh, June 2012

Left: local rambutan varieties sold at the festival

Below: Farmers / growers preparing produce for the fruit competition

Further Below: Collection of rare and underutilized fruits



Jackfruit:

The sweet giant

Commonly mistaken as a relative of the durian, the delicious jackfruit actually belongs to the mulberry family. It is widely grown in the tropical lowlands for food consumption but can also be used for timber, fuel and fodder, medicine, and industrial products. It is known to be the largest tree-borne fruit in the world, typically growing 30-90 cm in length and weighing 4.5-40kg when fully mature. Its succulent flesh is naturally sweet and has a subtle aroma.

Jackfruit (*Artocarpus heterophyllus*) is native to the rainforests of Malaysia and the Western Ghats of India. It has naturalized in many parts of the tropics, and is an important crop South and Southeast Asia. It is also grown in parts of Africa, South America, the Caribbean, Central America, the Pacific Islands, and North Australia.

Common Names

English	Jackfruit
Brazil	Jaca
Malaysia, Indonesia	Nangka
Bangladesh	Khaatol
India	Katahal, Halasu, Kaadhgi, Panasa, Pala
Sri Lanka	Chakka
Thailand	Khanun
New Guinea	Fanas, Ponos
Philippines	Langka
Myanmar	Peignai
Cambodia	Khnaor
Laos	Mimiz, Miiz Hnang
Vietnam	Mit

Plant Description

Jackfruit is a medium-size evergreen tree typically reaching 8-25m in height with a trunk diameter of 80-200 cm.

The tree casts a very dense shade and can have numerous side branches that begin near the ground.

Leaves of the plant grow up to 16 cm long, which are glossy dark green from above and pale green underneath. All parts of the tree release sticky white latex when damaged.

Jackfruit is monoecious, with both male and female inflorescences (flower clusters) on the same tree. Male inflorescences grow on younger branches are dense, cylindrical-shaped, and up to 10cm in length. Female flowers are larger and elliptical in shape. A high percentage of cross-pollination occurs from insects and wind. The flowers are reportedly pollinated by insects and wind, with a high percentage of cross-pollination.

Fruit Description

The inflorescences form a compound fruit or syncarp that is

oblong in shape, 30-90 cm in length, and weighs 4.5-30 kg. Because of its weight, fruit grows on the trunk and the tick part of main branches. The fruit is covered by a green to yellow-brown outer rind. Inside is a series of hexagonal, cone-like apices attached by central core and covered by a thick, rubbery, yellow-white wall. The immature fruit contains a lot of thick, white sap. When ripe, the flesh is sweet and a little acidic, with a hint of banana flavor

Covered by the flesh and a membrane, the brown rounded seed are typically 2-3 cm long and 1-1.5 cm in diameter. A fruit can contain up to 500 seeds.

Varieties

Commercial varieties are can be classified according to the thickness of its pulp. Varieties with a thin pulp tend to be sweeter, more fibrous, and more aromatic. Those with thick flesh are firmer, crisp, and less fragrant. Common varieties are Black Gold, Cheena, Cochin, Dang Rasimi, Golden Nugget, Golden Pillow, J-31, J-33, NS1, and Tabouey. Other varieties include Safeda, Khaja, Bhusila, Bhadaian, Handia, Velipala, Mammoth, and Everbearer.

Propagation

For commercial production, grafted plants are preferred to ensure uniform high quality seedlings. Seedlings for rootstocks develop very quickly, reaching 25 cm in 3-4 months before being grafted with the desired variety.

Vegetative production using cuttings or air-layering is also possible but is rarely practiced.

Pests and Diseases

In Asia, boring insects are the major pests of jackfruit. These include *Indarbela tetraonis*, *Batocera rufomaculata*, *Margarona caecalis*, and *Ochyromera artocarpio*. Other pests are mealybugs (*Nipaecoccus viridis*, *Pseudococcus corymbatus*, and *Ferrisia virgata*), spittle bugs (*Cosmoscarta relata*), longicorn beetles (*Aprona germari*, *Pterolophia discalis*,

Xenolea tomenlosa asiatica, and *Olenecamptus bilobus*), caterpillars of *Diaphania caesalis*, *Perina nuda* and *Diaphania bivitalis*), aphids (*Greenidea artocarp*i and *Toxoptera aurantii*), and thrips (*Pseudodendrothrips dwivarna*) are minor problems.

The most common disease of jackfruit is fruit rot caused by *Rhizopus artocarp*i. Rotten premature fruits fall from the tree, resulting to lower yields.

Other diseases include pink disease; stem, fruit, and male inflorescence rot caused by *Rhizopus artocarp*i; and leafspot due to fungi.

Harvesting

The best fruit quality is attained by harvesting the fruit when it is fully mature, then allowing it to ripen (3-7 days) in storage.

Fruits can take 3-8 months

to mature, which makes time a bad gauge for maturity. The best indicators for maturity are the change of skin color from light green to a slight yellow or brown, flattening of the skin spikes, yellowing of the leaf nearest to the fruit, and a hollow sound when tapped. Harvesting can be done between mid-morning and late afternoon to reduce latex flow.

Market

The immense size and weight of the jackfruit makes it cumbersome to transport. To avoid over-ripening, mature fruits should be harvested before they ripen. Post-processing can be done to add value and extend the shelf life.

Retail markets in Southeast Asia sell commonly sell ripe minimally processed jackfruit for fresh eating and unripe ones for cooking. The flesh is carefully removed and packed.



Jackfruits for sale in China

Quick Facts

Elevation: 1-1600 m above sea level
Rainfall: 1.0-2.4 m
Annual Temperature: 24-28 C
Soil: Well-drained, deep soil of moderate fertility
Soil Texture: light and medium
Soil Acidity: 5.0-7.5 pH
Drought: Tolerates 3-4 months
Shade: 30-50% when seedlings, 100% when mature
Frost: Tolerant
Waterlogging: Not tolerant
Wind: Tolerant
Pruning: Grows well after heavy pruning



Whole fruits and minimally processed jackfruit sold in Vietnam.

Nutrition Facts			
Serving Size 165 g			
Amount Per Serving			
Calories 155		Calories from Fat 4	
% Daily Value*			
Total Fat 0g			1%
Saturated Fat 0g			1%
Trans Fat			
Cholesterol 0mg			0%
Sodium 5mg			0%
Total Carbohydrate 40g			13%
Dietary Fiber 3g			11%
Sugars			
Protein 2g			
Vitamin A	10%	Vitamin C	18%
Calcium	6%	Iron	6%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.			
NutritionData.com			

Food Value

The fibrous fruit is composed of mono-, di-, and polysaccharides. It is also a good source of pectin and protein. A detailed list of nutrition facts is shown above, from www.nutritiondata.com.

The ripe fruit is usually eaten fresh but can be processed to jam, jelly, and chutney. The dried fruit can be made into high-quality candies. Freeze-dried jackfruit are also sold in a high price. The pulp is used for flavoring.

The unripe mature fruit is often cooked with coconut milk and curry. The leaves and flowers are also cooked as vegetables. The seeds are boiled or roasted and eaten as snack.

Other Uses

The tree is reported to have medicinal properties. The seeds are said to relieve biliousness and when roasted, is an aphrodisiac. The ash of jackfruit leaves, when combined with coconut oil, is said to heal ulcers. The latex aids in healing of abscesses, snakebite and glandular swellings.

The root remedies skin diseases and asthma, while its extract is used for fever and diarrhea. The bark is made into poultices, while wood is a sedative property and is said to induce abortion.

Other uses include:

Leaves: animal fodder, food wrapper, & woven plates
Wood: fuel, timber, and crafts
Bark: ropes & tannin
Latex: glue, bird and insect traps, & chewing gum,

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Rust-like symptoms and rot on jackfruit: a combination of disease and abiotic factors?

Photos courtesy of Dept. of Agriculture, Malaysia

The urban consumer preference for convenience and prepared food has prompted interest in the promotion and production of minimally processed items for fruits, roots and vegetables.

Minimal processed fruits involve separation of the edible portion of the fruits and packing them in 'ready to eat' packages under hygienic and refrigerated conditions.

Due to handling inconvenience because of its large size and presence of latex in the fruit, jackfruit or *Artocarpus heterophyllus* has been a popular fruit for the minimum processed market. It has a



Brown specks that will later coalesce to cause 'flesh' rot



**Above: Fruit rot on base of peduncle
Below: Fruit rot inside the peduncle**



big potential for the export market because of the increasing demand for quality and safe tropical fruits, convenience packaging, and minimum requirements for Sanitary and Phytosanitary (SPS) regulations from importing countries.

Fruit quality is dependent on the condition of the 'bulbs' or 'flesh' (seeded arils or fully developed perianths). Good quality jackfruit favoured for minimum processing is normally sweet with a thick rind and deep yellow in color. The sweeter varieties command a better price.

Recently there have been numerous reports of rust coloured specks or streaks appearing on the 'flesh' of the fruit. In the advance stage, the specks coalesce and cause the 'flesh' to rot. This condition affects the eating quality of the fruits due to its unpleasant taste. The other observed symptoms are:

- Browning and rotting at external fruit surface (advanced infection)

- Rot may be visible at base of peduncle
- Brown discoloration along peduncle to fruit central core
- In the advance stages, brown spots also occur on the unseeded arils (perigones)

This situation, if not checked can seriously thwart efforts to enhance market access for minimal processed jackfruit.

Symptoms

Some observations and reports on the occurrence of this condition are:

- Most are observed to occur after or during the rainy season, where humidity is relatively high
- Symptoms appear more in 'stressed' plants as a result of nutrition imbalances, soil types and terrain conditions and injury.
- Healthier trees are more tolerant
- The condition is found in

all fruits showing initial or advanced external symptoms such as dark rot spots and the presence of mycelia or spores.

- The symptoms may also appear in fruit which do not exhibit any external symptoms on the fruit surface.
- Initial symptoms can be identified by brown discoloration when the fruit stem or peduncle is cut.
- The condition is found in specific varieties, especially the sweet varieties with high brix content in the fruit.
- An inconsistent pattern of incidences, where fruits on a tree affected this season may not be affected the next season. This confirms that incidences are

weather related.

- Studies by the Department of Agriculture, Malaysia indicate that the condition is related to a fungal disease – Fruit Rot of Jackfruit. The causal agents identified are *Rhizopus artocarpus* and *Lasioidiplodia* sp.
- Initial treatment with prophylactic sprays using Copper Oxychloride seems to reduce disease incidence.

Probable causes

The occurrence of this condition is believed to be caused by a combination of abiotic factors such as weather, soil types, terrain and plant nutrition which affects

plant health, and a fungal pathogen. The pathogen identified to cause infection is *Rhizopus artocarpus* is a 'Cosmopolitan' fungus that is ubiquitous and universally identified as a causal agent which infects male flowers and fruits through injury, causing fruit rot. Another pathogen, *Lasioidiplodia* sp, a latent fungus also contributes to this condition. Generally interplay of plant health, abiotic conditions and the presence of these pathogens causes this malady.

Proposed mitigation measures

- Continuous monitoring of the incidence in commercial growing areas. Monitor disease incidences by checking on symptoms on the male inflorescence and internal fruit symptoms by inspecting the peduncle.
- Prophylactic sprays using Copper Oxychloride especially during the rainy season.
- Cultural methods including pruning of low branches, restricting number of fruits, getting rid of infected male inflorescence, disinfecting wrapping bags, avoiding injury to developing fruits, and destroying diseased fruits.
- Practice mixed cropping with other fruit types.
- Consider other less susceptible varieties for commercial planting.

Readers of this article are requested to provide inputs if they have experienced similar incidences. Please respond to info@itfnet.org

Article summarized by TFNet from presentations by DOA Malaysia and Malaysian Agricultural Research and Development Institute during a technical review.



Symptoms of fruit rot on the surface



Browning in fruit midrib

Jackfruit Business in Sri Lanka

Based on an article by Shree Padre

Historically, the jackfruit has always enjoyed the status of a holy tree in Sri Lanka. Named baat gasa or 'rice tree' it is said to have saved Lankans from hunger in a crisis. Most jackfruit enterprises on the island are medium scale operators and home industries. This strategy has made jackfruit products affordable for everyone.

Since the past 10 years, the Sri Lankan Horticulture Crop Research and Development Institute (HORDI) has trained free of cost, street vendors, housewives and entrepreneurs in minimal processing, dehydration, and bottling technologies. The institute's ex-students now manufacture a range of jackfruit products for the domestic and export market, yielding jobs and money.

Sri Lanka has become the world leader in making jackfruit the key to food security and raising the incomes of the poor. Short duration training and support have empowered rural families, converting their extra backyard jackfruits into products for sale in

urban markets.

According to Dr Subha Heenkenda, Research Officer at HORDI, the total area under jackfruit on the island is 50,000 hectares estimates, the island's total annual production of jackfruit is 1400,000 tonnes.

Products

1. Minimal Processed Jackfruit

Sri Lanka has around 70 units today which produce ready-to-cook jackfruit after minimal processing. These packets are sold to vegetable shops and supermarkets. Then, there are hundreds of street vendors who cut jackfruit in front of their customers or sell pre-packed jackfruit.

The jackfruit is cut into three different shapes for three different curries. The cube shape – exclusively meant for polos curry – is the most popular. For polos mellum, tender jackfruit is chopped into small bits. Very few vendors sell jackfruit in



large pieces for making cutlets or dunking into biryani.

2. Dried Jackfruit

Sri Lanka has also been very successful in training poorer communities in dehydration, a technology that extends the shelf life of vegetables and fruits up to six months at least.

The leader in popularizing dehydration technology is the Rural Enterprises Network (REN) started in 2002. They have developed low cost driers that run on firewood and sawdust that can dry 20 kg in a batch.

Jackfruit Curry

(Source www.rakskitchen.net)

Ingredients

1/2 green sliced jack fruit
3 nos. of peeled sliced potatoes
2 nos. chopped onions
1 tbsp. ginger paste
1 tbsp. garlic paste
1 tbsp. mustard oil
1/2 tsp. turmeric powder
1/2 tsp. cummin powder
1/2 tsp. coriander powder
1/2 tsp. red chilli powder

1/2 tsp. kashmir mirch powder
1 chopped tomato
2 bay leaves
Salt to taste

For Garam Masala:

1 no. big elichi
2 nos. green cardamom
1/2 inch Cinnamon
2 nos. clove
a little star anise
a little jayatee & jaiphal

Instructions

1. Put the sliced potatoes & green jackfruit into the pressure cooker. Add required water with 1/2 tsp. of salt. Allow to steam up to 2 whistles. Remove from fire & allow it to cool.
2. Put a frying pan in fire. Add 1 tbsp. of mustard oil to heat. Add bay leaves. Add chopped onion till it becomes light brown. Add ginger & garlic paste and cook till the masala are fried. Add turmeric, cumin, coriander, red chilli powder & mis with the masala.
3. Add chopped tomatoes and cook it for 2 minutes till the tomatoes got soften. Add kashmir mirch powder.
4. Grind the garam masala ingredients & add to it. Add 1 cup of hot water.
5. Add boiled potatoes & jackfruits and cover it with a lid. Cook it for 3 minutes.

Minimal processing of Jackfruit

Based on an article by Latifah Mohd Nor, et. al., MARDI, Malaysia presented during the "International Seminar on Consumer Trends and Export of Tropical and Subtropical Fruits"

The need for jackfruit to be minimally processed is greater than subtropical and temperate fruits because of its large size and difficulty in peeling.

Minimal processing can ease export by reducing air-freight cost and quarantine barriers. The products also have uniform and constant quality, require less storage space, has reduced waste and handling issues.

Induced ripening is recommended for jackfruit to ensure a more consistent fruit quality. A static or flow-through ripening system with ethylene gas is recommended.

Jackfruit must be subjected to pre-cooling treatment at 2°C for 24 hours prior to minimal processing operations.

Cutting should be done quickly in a clean environment to reduce contamination. Sharp knives can reduce product injury.



Hygienic condition for jackfruit minimal processing.

The flesh should be packed immediately after cutting. The packaging material should provide enough space for air to minimize anaerobic respiration, leading to spoilage. Rigid containers are highly recommended to reduce physical injury during storage, transportation, or market display.

Polypropylene containers can be used for retail packaging. Containers can be stacked, increasing the speed and efficiency of packaging and handling. Jackfruit packed with this container exhibit better color, retaining a fresh aroma and taste.

Bulk packaging using frozen gel can be used for sea shipment.

For air transportation, dry ice is more economically viable.

Product labeling is important to identify the product, portray the "brand", and provide information on expiration date, consumption instructions, nutrient information, and storage instructions.

For market distribution and display, the products must be kept at 2°C to extend the shelf life up to 3 weeks.

So far, minimally processed jackfruit from Malaysia has been successfully exported to the Netherlands, Dubai, Amsterdam, Rotterdam, Belgium, and Zurich.

Jackfruit Compote (Source: www.virtualherbarium.org)

Ingredients

4 cups jackfruit arils diced in quarters or eights
 ½ cup water
 1 cup sugar
 1 full tsp finely diced ginger
 1 tsp lemon juice
 1 tsp lemon zest
 1 tsp cloves
 1 cinnamon stick

Instructions

1. Place the sugar and water in pot over medium heat to melt the sugar.
2. Add all the other ingredients in the order shown.
3. Cook until the jackfruit is soft, about ten minutes.

Jackfruit Patties

Ingredients

4 cups green Jackfruit flesh (uncooked)
 4 cups heavy cream
 2 eggs
 3 cups flour
 1/4 cup scallions, chopped
 1/4 cup onions, chopped
 1 tsp sugar
 1 tsp salt

Instructions

1. Place the sugar and water in pot over medium heat to melt the sugar.
2. Add all the other ingredients in the order shown.
3. Cook until the jackfruit is soft, about ten minutes.

Sime Darby introduces line of pink guava juice

TFNet Associate Member Sime Darby Plantation introduced GOFRESH™, a new line freshpink guava juices.

GOFRESH™ comes in four flavors, Pink Guava Original, Pink Guava with Cranberry and Apple, Pink Guava with Pineapple and Orange, and Pink Guava with Orange.

The guava is grown in Sime Darby Beverages Sdn Bhd's (SDB) in Perak, Malaysia.



Pink Guava Original



Pink Guava mixed with Cranberry & Apple

Pink guava nutrition facts

Nutrients	Content/100g	Nutrients	Content/100g
Vitamin C	242	Protein	0.8
Vitamin A	280	Fat	0.6
Calories	62	Phosphorous	42
Calcium	23	Sodium	4.0
Iron	0.9	Potassium	289
Fiber	5.6	Thiamin	0.05
Carbohydrates	15	Riboflavin	0.05
		Niacin	1.2



Pink Guava mixed with Pineapple & Orange



Pink Guava mixed with Orange

Contact details:

Sime Darby Beverages Sdn Bhd
c/o Sungei Wangi Estate
32000 Sitiawan,
Perak

Tel: (605) 693 1911
Fax: (605) 693 1910
Email: gofresh@streamyx.com



“Drink yourself pink. Just like me.”

Pink guava juice bursting with vitamin C & lycopene, an active antioxidant. Go pink.Gofresh.

The best from Sime Darby

Sime Darby Foods & Beverages Marketing Sdn Bhd (712956-90)



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MEMBERSHIP APPLICATION FORM

Name (Government/Organization/Individual): _____

Correspondence Address: _____

City: _____ Postcode: _____

State/Province: _____

Country: _____

Telephone: _____

Fax: _____

Email: _____

Payment Enclosed (USD): _____

Authorized Signature: _____

Name: _____

Designation: _____

Date: _____

I/We wish to join TFNet as:

- ☐ Country Member
- ☐ Associate Member
- ☐ Ordinary Member

Membership Fees per calendar year
(as of 20 Aug 2009)

- Country Members: USD 5,000 (one time)
- Associate Members: USD 500
- Ordinary Members: USD 50

Payment by International Bank Draft payable to

Account name: **International Tropical Fruits Network**

Account number : **A/C No. 7121-4700-0396**

Bank address: Malayan Banking Berhad

No. 231-233, Jalan 18/23, Taman Sri Serdang,
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For more information, contact us at info@itfnet.org or tweet us at @TFNet.

The International Tropical Fruits Network (TFNet) is committed to the sustainable development of the global tropical fruit industry in relation to production, consumption and trade. It is set up under the auspices of the Food and Agriculture Organization of the United Nations.

Membership benefits include:

- Sharing information, expertise, and technologies.
- Participation in conferences and seminars.
- Market development and trade promotion.
- Human resource development.
- Participation in collaborative projects or studies.
- Assistance in implementation and harmonization of international regulations.

For more information on membership, kindly visit www.itfnet.org or email info@itfnet.org. You can also tweet us at @TFNet.

International Tropical Fruits Network (TFNet)

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