



INTERNATIONAL SOCIETY FOR HORTICULTURAL SCIENCE

Section Tropical and Subtropical Fruits

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Dear Colleagues,

Greeting from Chair and Vice-Chair, Section, Tropical and Subtropical Fruits.

In the last six months (January to June, 2015), Section organized two International Symposiums successfully. International Symposium on GA3 (guava, wax apple, pineapple and sugar apple) Tropical Fruit was held at Kaohsing, Taiwan from 8-11 April, 2015. The program of the symposium consists of two days' technical session and two days' field trip to different GA3 orchards. The second was on International Symposium on Durian and other Humid Tropical Fruits at Chanthaburi, Thailand from 2-4 June, 2015. This symposium was attended by about 200 participants from eight countries. There were two days of technical sessions and one day field trip to durian, rambutan, longan, mangosteen and other humid tropical fruits orchards and pack house. We have many important events in 2015 (please visit Calendar of ISHS events at www.ishs.org/calendar for details).

We believe you will enjoy reading the e-Newsletter and we will look for your comments, suggestions and inputs for the coming issue

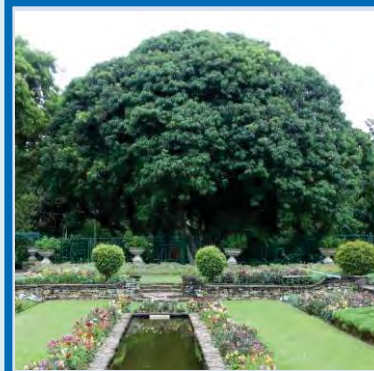
Dr.Hannah Jaenicke
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Section Tropical and Subtropical Fruits

Litchi Production in South Africa

South Africa's litchi production is fairly young. Litchis were introduced to South Africa from Mauritius in 1875 and the first and oldest litchi tree in South Africa was planted that same year at the Durban Botanical Gardens on the east coast of South Africa (Fig. 1). From there, litchis spread to the other subtropical areas in the north east of South Africa. Today the main production regions are located in the frost free areas of the Mpumalanga and Limpopo Provinces in the north of the country. According to the latest census the total litchi plantings amount to 1,731 ha (Nortjé, 2012).



The oldest litchi tree in South Africa, planted in the Botanical Garden in Durban in 1875.

Seventy percent of litchis are produced in the Mpumalanga Province, followed by the Limpopo Province with 25%. Only 5% are produced in the KwaZulu-Natal Province.

Planting distances range between 12 x 12 m for the oldest plantings, 10 x 10 m, 8 x 4 m, 6 x 6 m and 6 x 3 m in high density plantings (mostly 'Wai Chee'). In the past 10 years the industry produced between 2,477 and 8,585 tons per season (SALGA, 2012).

The main cultivar planted in South Africa is 'Mauritius' ('Tai So'), followed by 'McLean's Red' ('Madras') and 'Wai Chee'. Other cultivars are 'Fay Zee Siu', 'Third Month Red' and 'Early Delight', formerly known as R1G22. The cultivar distribution can be seen in Figure 2. 'Early Delight' is a selection from the ARC-Institute for Tropical and Subtropical Crops' Plant Breeding Programme (Fig. 3). Due to its earliness this cultivar is becoming very popular and is increasingly planted in the early production areas.

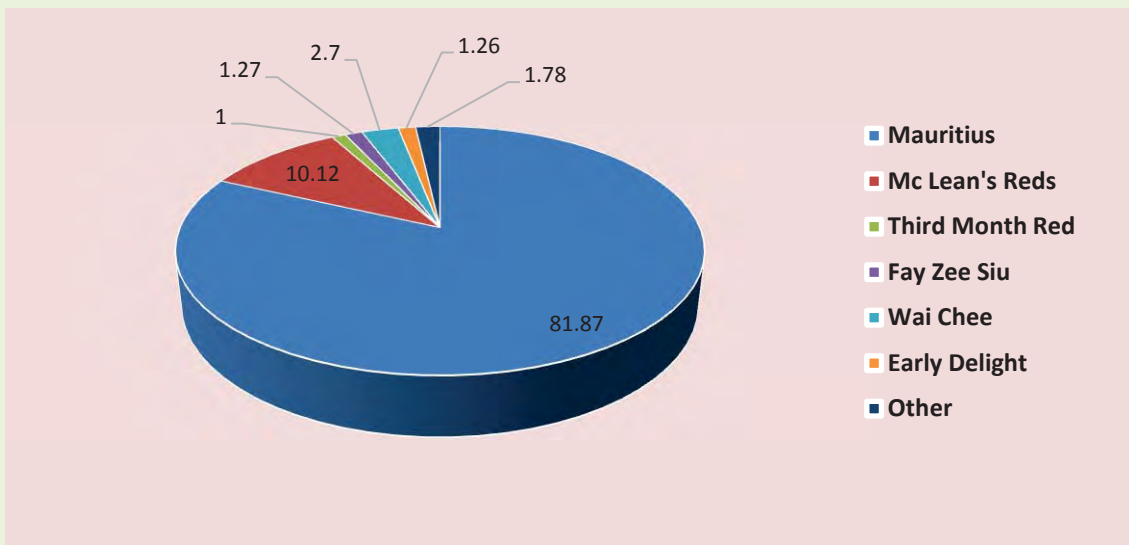
Average yield of producing orchards is around 6-8 tons per hectare, but 20 tons per hectares have been achieved with 'Mauritius' in the early production area of Mpumalanga Province. The harvest season starts in October with 0.1% of the production, peaking in December with 53.9% of the production and ending in March with 0.8% of the production. The majority of the crop is mainly exported to Europe (56%), with Madagascar being South Africa's biggest competitor on this market. Thirty seven percent of the fruit are sold locally and 7% are processed to juice (SALGA, 2012). Over the past 10 years the local market segment has increased due to higher prices as result of better promotion and fruit quality, but also due to expanding metropolitan cities and higher income of a growing middle class population.



The cultivar 'Early Delight'.



As with most litchi production countries, litchi production in South Africa is limited by adverse climatic condition during flower induction/initiation as well as flowering and fruit set. Autumn and winter temperatures are sometimes too high causing the trees to flush instead of flowering. The use of ethephon to control this unwanted flush has been used as general orchard practice for the past 10 years and has contributed to increasing and more consistent yields. Ninety percent of litchi trees in South Africa are under micro or drip irrigation, which is important especially during the flowering period as the climate during spring is dry and warm winds often occur. Fertilization is done mainly by hand as soil application, but some growers also practice fertigation. Micro nutrients are generally applied as foliar sprays. Pruning is used for mature orchards to maintain tree height and shape and to maintain sustainable production. The litchi industry in South Africa is very fortunate to have only a few pests (fruit flies, litchi moth, nematodes) and diseases (tree die-back). Other production challenges include finding alternatives for sulphur fumigation as post-harvest treatment, food safety standards and phytosanitary restrictions for access to new markets and sustainable long term farming visions. In 1987, the South African Litchi Growers' Association (SALGA) was formed. SALGA represents the local litchi industry. In 2006 the Subtropical Growers' Association (Subtrop) was formed which represents the Litchi, Avocado, Mango and Macadamia Growers' Associations and coordinates research and extension services, as well as market development within the different growers' associations. Subtrop also represents its member associations on government and other forums. SALGA's main focus is to support research for the industry. Current research priorities include: increasing flowering and production by improved flush control measures and water and fertilization management, cultivar development to extend the harvest and marketing season as well as facilitating market access to the USA and other countries.



Cultivars planted in South Africa (%). Source: Nortjé, 2012.

References:

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Dragon fruit (*Hylocereus undatus*) also known as “pitaya” fruit has played an important role in small farmer horticulture in Vietnam for many years, mainly as a cash crop for rural and urban domestic markets. Vietnam currently is the leading dragon fruit producer in the world and the planting area has reached to 28,700 ha which is an 18 fold increase compared to the areas during 2008 - 2009. BinhThuan (20,270ha), Tien Giang (4,200ha) and Long (5,196ha) provinces are the main dragon fruit production areas which produce 90% of dragon fruit in Vietnam. The total production is about 617,500 tones. Besides, it is also grown in Mekong Delta and some northern mountainous provinces with small area. Export volume of dragon fruit in Vietnam was largest in the world, about 80-90% of production is destined for China, Thailand, Indonesia Japan, South Korea, Europe, the United States, New Zealand and 30-plus other countries. In the first 5 months of 2013 exports reached 120.6 thousand tons with a value of 78.9 million USD, an increase of 3.7% in volume and 24.1% of value compared to the same period in 2012 (Ministry of Industry and Trade 2012-2013).

Dragon fruit cultivars

White flesh: This variety with white flesh and pink peel was first introduced to BinhThuan province centuries ago which subsequently reached to the Mekong Delta and grown in 2 provinces Long An and Tien Giang. White Flesh variety dominates than red fleshed one and has more plantation area which accounts for more than 90% of the growing and production in Vietnam. Two lines of white fleshed variety were developed i.e., BinhThuan and Cho Gao.

LD.No1: This is a hybrid of “White Flesh” x “Red Flesh” dragon fruit (introduced from Colombia), which was evaluated for adaptation to different ecological zones, fruit yield and fruit quality in the Tien Giang, Long An and BinhThuan provinces (Yen, *et al.*, 2005). This hybrid was registered to Ministry of Agriculture and Rural Development and released to grower in November 2005. “LD.No1” fruit weight 350-400g, Brix 16%, red flesh, fruit firmness 0.7kg/cm², easy fruit set without hand pollination.

LD.No5: This is a hybrid of “LD.No1” x “White Flesh”. This hybrid is vigorous, plant pink producing, green scale, with fruit weight 350-400g, Brix 17%, fruit firmness 0.96- 1.0 kg/cm². “LD.No5” fruit quality is better than “LD.No1” during rainy season. Production the LD. No5 hybrid dragon fruit was evaluated including VCU and DUS tests (Thi, *et al.*, 2010). This hybrid was registered to Ministry of Agriculture and Rural Development and released by SOFRI in 2011.

Planting density and establishment for new planting system

Plants are usually established on well-drained beds. The traditional Mop top production method is followed. Planting density of dragon fruit are about 1,000 – 1,200 supporting posts per ha. Three to four cuttings are used for each post depending on post size and farmer preference. Plants spacing are 2.5m x 3.0m or 3.0m x 3.0m depending on the size of the orchard equipment to be used. Improving sustainable production systems for dragon fruit are being undertaken in collaboration with Plant Food Research (PFR), New Zealand and SOFRI. Agro-techniques were standardized for optimum plant density, pest and disease control, high yield and fruit quality. Spacing depends on framework system and plant structure desired.



LD.No1 dragon fruit variety



LD.No5 dragon fruit variety





The GAPs standard application on dragon fruit

Dragon fruit has been exported to China, Hong Kong, Malaysia, Taiwan, Thailand, Singapore, Holland and Germany. The price of dragon fruit in recent years was found to decline which can be attributed, in part, to their dependence on local and nearby export markets. The potential of dragon fruit exports to high value western markets has been seriously constrained since most small farmer production techniques do not comply with international regulatory and food safety requirements. The dragon fruit sector has clearly suffered from the lack of an appropriate model for the implementation of internationally acceptable, good agricultural practices (GAPs). Vietnam have 250 ha Global GAP certified plantation area in 2009 and to date have 7500 ha Viet GAP certified (Hoa, *et al.*, 2011; Nhat Hang, and Hoa, 2014).



New planting system trial in orchard of SOFRI

Increasing research and development activities on dragon fruit

- Dragon fruit continue to be looked upon as a tropical fruit with export potential in Vietnam
- Dragon fruit industry development agendas were formulated by taking into account value chain and production aspects.
- Dragon fruit research and development activities will be intensified and expanded to focus on long term needs. This will include research on breeding program for better quality and diversity of flesh color for export market; Improved cultivation techniques, off-season flowering, integrated management of pest and disease, product development, post-harvest technology and marketing strategy for high yield and better fruit quality. Research efforts will also be expanded through collaboration between researchers from within and outside the country.

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- Thi, N. N., Yen, T.T.O. and Chau, N.M. (2012). The results of VCU test of LD.No5 variety in Mekong delta and Southeast areas of Vietnam. *Journal of Vietnam Agriculture Science and Technology*, 6: 24-29. (In Vietnamese)

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Wax apple in Taiwan

Wax apple (*Syzygiumsamarangense*Merr. & Perry) is a popular fruit of Taiwan because of its attractive appearance and taste. The wax apple cultivation in Taiwan is highly concentrated in Pingtung County, accounting for 78% of total planting area. Regardless of the stable demand for the domestic and export markets, the production area in Taiwan has decreased by about 30% in the last decade, mainly due to labor shortage, high technical threshold and production risk. Nevertheless, wax apple cultivation area in the central Taiwan has been increasing in the recent years, especially in Nantou, Chiayi and Yunlin Counties. The extent of production regions brought advantages on year-round fruit supply. The early winter market demand between October and December is filled by the supply from Liukuei district of Kaohsiung city. Produce from the Pingtung area dominates the winter and spring needs from November to May. The cool temperature at the high elevation areas (600-1000 m above sea level) of Chiayi and Nantou facilitates niche market production between June and September. In addition, quality fruits from cultivars with consistent fruit coloring and low cracking can be produced between March and May in Pingtung and between June and September in central Taiwan.



Wax apple orchard



Covering of fruits



Among the cultivated varieties, "Pink", 'Big Fruit', "ThubThim Chan' and "Indonesia Big Fruit' are the most popular ones. Adjustment of production period is the unique technique developed in Taiwan, through which fruit production can be manually adjusted from summer to winter. Production techniques such as cross breeding to improve the defect of fruit shape and fruit color, pruning to enlarge fruit size, girdling to decrease fruit cracking ratio, and orchard covering to decrease the chilling injury have been developed by the researchers. Wax apple is very sensitive to low temperature chilling injury. Researchers at Taiwan observed pitting, peel discoloration, and off-flavor development when "Pink" wax apple was stored at below 10°C, therefore the fruit should not be stored lower than 10°C to avoid severe chilling injury.

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FORTHCOMING EVENTS



Forthcoming Events

