

Economic aspects of Coconut Lethal Yellowing in Jamaica

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The cultivation of coconut palm (*Cocos nucifera* L.) in Jamaica and the problem of lethal yellowing (LY)

The Newsletter #1 of Tropicsafe focused on lethal yellowing (LY), a phytoplasma disease detected in over 50 palm species (Bertaccini et al., 2014) with the most devastating effects on coconut palm (*Cocos nucifera* L.), a crop cultivated in 90 countries around the world. The coconut palm is an important crop in many tropical countries, providing food products and raw materials for industries (Jones, 1991). It is cultivated by about 11 million farmers on 12 million hectares; 80% of total production comes from Asia (Adkins et al., 2006).

Coconut palms contribute to the scenic, beautiful landscapes of the Caribbean region and add to the feeling of relaxation for tourists on the sandy shores of the Caribbean. In Jamaica the crop is an important source of income and a vital part of the subsistence agriculture in rural villages (Figure 1). Compared to other cash crops, the tree requires fewer inputs but provides food and much needed income. The relentless spread of lethal yellowing throughout the coconut growing areas is having a serious impact in many vulnerable communities, as it threatens income and food security for many Jamaicans involved in the agricultural sectors (Myrie, 2006).



Figure 1. Coconut palm plantation in full production

The coconut is not indigenous to Jamaica. This palm was first introduced in the middle of 16th century, initially near harbours and coastal settlements and later inland. The coconut became an industrial crop in the 19th century, increasing its economic importance with the use of coconut oil as raw material for the manufacture of soap, cosmetics and margarine. Initially, the main variety grown was the Jamaica Tall; since then, more than 60 varieties have been introduced, because of diseases and hurricanes.

Figure 2 shows the production of coconuts in Jamaica since 1943. Before 1961, LY was confined to the western region of Jamaica and in 1961 (Carter, 1964) it suddenly appeared in the Buff Bay area, about 110 km from the nearest case in the west. The disease then spread rapidly to the east, the principal coconut growing regions, and by 1971 the disease was detected on the whole island (Coconut Industry Board, 1984 and 1985). By 1980, LY had been responsible for the death of over 7 million coconut palms in Jamaica (Myrie and Bertaccini, 2018). Since the 1970s, the Jamaica Tall variety (the most important in Jamaica) was progressively replaced by less susceptible varieties such as the Malayan Dwarf, Panama Tall and a first generation (Maypan) of hybrid varieties. However, since the mid-1990s, an alarming number of these varieties have succumbed to a new epidemic of lethal yellowing disease. After hurricane Gilbert in 1988, the incidence of lethal yellowing increased significantly. At various locations along the coastal areas of the northern region, mortality levels among stands of Malayan Dwarf (MD) and Maypan (MP) were observed to be consistently higher than expected. This pattern continued even in the 1990's and 2000's.

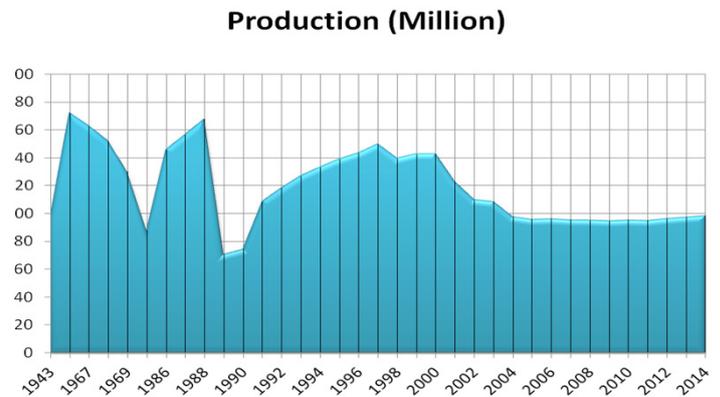


Figure 2. Production of coconuts in Jamaica (1943-2014, million nuts per year, Source: CIB)



Figure 3. Coconut palms severely affected by LY in Jamaica: on the right a bare trunk and in center a yellowing almost dead palm.

An important step in the local coconut industry occurred when a producer organization was formed in 1930, the Jamaica Coconut Producers Association. The association brought order in the chaotic coconut industry at that time, when most of the coconut was produced and exported by independent operators. The government of the day felt it was prudent to draft and enact specific legislation to protect the local industry from external competition. In 1945 the Coconut Industry Board (CIB) was established as a statutory body with the aim to administer the coconut industry (Figure 3). In 1959 the CIB established a research department and later an advisory division. CIB primary functions include informing the government on the status of the industry and advising on policy direction, performing research on the agricultural problems of the industry and providing technical support to farmers.

The socio-economic importance of coconut sector in Jamaica

Although agriculture's contribution to Jamaica's Gross Domestic Product (GDP) has steadily declined over the past two decades (and in 2009 stood at 5.2%), this sector absorbs 20% of the country's employed labour force. The agricultural economy in Jamaica is dualistic, including large-scale commercial plantations that produce primarily for the export market under a system of monoculture, and small-scale mixed farms that produce for household subsistence and the domestic market. This dualism extends beyond production orientation, and is also reflected in farm size, access to agricultural resources and infrastructure (FAO, 2013). Cultivation varies from just a few very intensively-maintained and comparatively large-scale plantings to derelict plantations that were formerly under estate management and now show little sign of maintenance. Today, the production of coconut is concentrated in the eastern parishes of St. Thomas, St. Mary and Portland. The industry has approximately 4,700 producers who are largely small farmers with less than 10 hectares under coconut cultivation (CIB, 2017). While Jamaica has the largest coconut industry in terms of harvested land in the region, there has been a decline in acreage under coconut cultivation. Moreover, annual production appears to have remained fairly static from 2002 to 2015 (W. Myrie, unpublished). In the Caribbean and Latin America region, apart from the copra and other conventional products, coconuts are used to obtain a range

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of value-added products such as coconut cream, coconut water, coconut milk and coconut oil (Figure 4). This is very important considering that diversification of production can result in social and economic benefits for many areas.

The coconut production is insufficient to supply local demand: in 2012 approximately 1.3 billion Jamaican \$ (US \$ 11.4 million) of coconuts and its by-products have been imported in Jamaica to satisfy the local demand (STATIN). In 2015 there were more than 15,989 ha under cultivation and an estimated tree population of 3.54 million producing approximately 99.2



Figure 4. Small street shop selling local coconut product in Port Royal, Kingston, Jamaica.

million nuts with a total value of 4.71 billion Jamaican \$ (CIB, 2016).

The consequence of the lethal yellowing (LY) disease is a large scale crops loss and a lack of income that, in some cases, results in more farmers moving to urban areas, exacerbating rural poverty (Allen et al., 2005) and the decrease in import substitution and foreign exchange savings. In Jamaica, the impact of LY has been particularly important for all the communities of smallholders and subsistence farmers that rely nutritionally and economically on coconuts (Myrie et al., 2011) and also on the 150,000 persons directly and indirectly employed in the coconut industry. There is a viable management tool for controlling the spread of the LY disease which include 5 steps procedures of monitoring, removal of infected coconut trees, replanting new seedlings, proper weed control and a sound fertilization programme. The CIB screened the local population for LY resistance and, with the international assistance, introduced a field-tested coconut variety from all the major coconut-growing regions.

One can get an idea about the economic loss due to the LY disease, considering the case of a farm with 11,838 Maypan coconut trees in St. Ann, completely destroyed by the disease. Every tree was producing an average of 60 nuts per year, a total of 710,280 nuts per year. The farm gate price was 35 Jamaican \$. This means a loss of Gross Saleable Production equal to 24,859,800 Jamaican \$ (US\$ 207,165).

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