



■ THE PROBLEM ADDRESSED

The importance of coconut in the TROPICSAFE partner countries

One of the aims of TROPICSAFE is to evaluate the impact of the solutions proposed to manage lethal yellowing, one of the most serious diseases affecting coconut in the world. The focus is made on Jamaica, Ghana, and Mexico, where the spread of the disease in the last decades has been responsible for the loss of an overwhelming majority of coconut production. The analysis is carried out using mainly official data from FAOSTAT, integrated with information available on academic literature, as well as data published by agribusiness organizations.

Economic and social aspects are considered to define the relative importance of the crop at national and international level and, in particular, the consequences of the disease on the local agri-food chain and the exchange with other countries. The dynamics of production, yields, and import-export also give an idea about the entity of the loss and the capacities of the national system to face the crisis.



- Coconut palm ovary used for the pollination by hand to obtain productive hybrids.

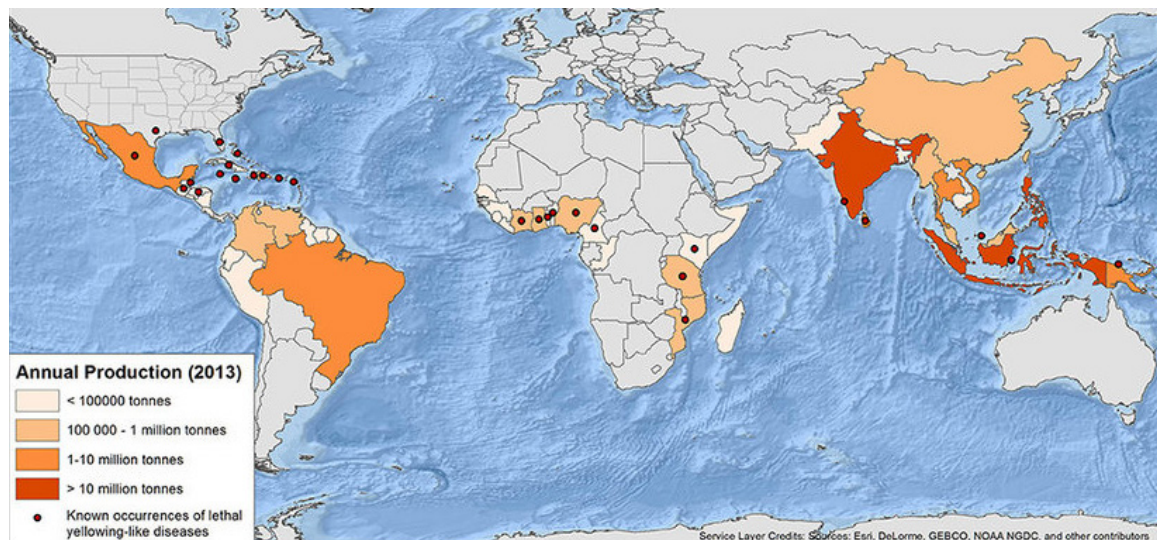
■ LATEST RESEARCH RESULTS

Overview on the importance of worldwide coconut production

Coconut is the sixth most cultivated fruit in the world: it is grown in 87 countries, covers 11.8 million hectares, has an annual production of almost 63 million tonnes of nuts (FAOSTAT, 2019), and provides a gross production value of USD\$ 9.7 billions (FAOSTAT, 2018). Around 73% of the world area producing coconut is concentrated in the Philippines (31%), Indonesia (24%), and India (18%). Jamaica and Ghana occupy a marginal position of worldwide coconut production (0.2% and 0.6% respectively), while Mexico is one of the ten biggest producers. The coconut trade is mainly in processed products (coconuts desiccated, copra, coconut oil). Indonesia is the leader export country followed by Thailand and Vietnam. On the import side, China is the first importer followed by the United



States of America and the Netherlands (FAOSTAT 2019). The figure below shows the spreading of lethal yellowing disease in the main producing countries. In Ghana, the Cape Saint Paul wilt disease (CSPWD) caused the collapse of the coconut industry in the 1950s (Leather, 1959). The disease has been responsible for the death of over 7 million palms in Jamaica in the 1980s, and the country is recurrently devastated by epidemic outbreaks (Lebrun *et al.*, 2008). In Mexico over the last two decades of the 20th Century, the lethal yellowing epidemic disease led to a drop of 60,000 ha in cultivated area, and a decrease in cultivation density from 100 trees per hectare to just 60 (Zizumbo-Villarreal *et al.*, 2006).



- World map of annual coconut production and published occurrences of lethal yellowing-type diseases of palms production (Gurr *et al.*, 2016).

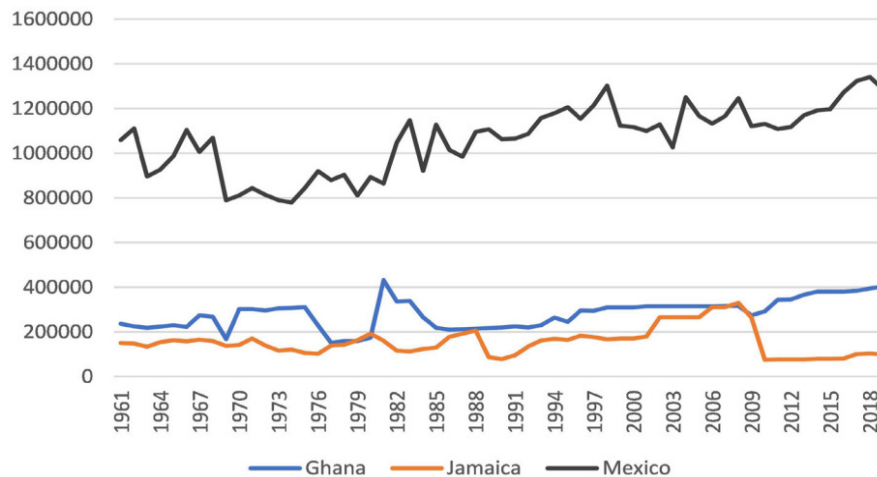
■ THE TROPICSAFE RESEARCH AND DEVELOPMENT ACTIVITY

The coconut market in Jamaica, Ghana, and Mexico

Jamaica: According to the Coconut Industry Board (CIB), a public body promoting the efficiency and the interests of the coconut businesses, the production is provided basically by small and medium enterprises (SMEs). The majority of farms have a surface smaller than 10 ha. In 2019 coconut crops covered around 15,796 ha with a production of 99,200 tons (FAOSTAT, 2019). Since the lethal yellowing destroyed both local and hybrids varieties, several management strategies have been implemented to reduce the spread of the disease. The CIB has also promoted the distribution to farmers of seedlings of the resistant variety Special Malayan Dwarf Yellows.

Ghana: In this country, coconut is the most important cash crop along the coastal belt mainly due to its various by-products. Data available in academic literature reported that, since the first incidence of the disease in 1932, the three main regions of coconut production (the Western, Central, and Volta Regions) have been devastated (Danyo, 2011). More recently, both coconut production and export have increased significantly. According to FAO data, in 2019, the coconut production amounts to 403,905 tons on 75,195 ha. Around 80% of the coconuts are produced by smallholder farmers. The export of desiccated coconuts totaled USD\$1.4 million – but currently, most coconuts are consumed locally.

Mexico: Mexico ranked 7th in the worldwide coconut production in 2019, accounting for 1,287,957 tons cultivated on about 204,133 ha. Mexican dry climate, as well as the distance among plantations, resulted in lethal yellowing outbreaks less explosive than in other countries, such as Jamaica, with higher rainfall and higher density of palm plantations (Mora-Aguillera, 2002).



- Coconut production (tons) in Jamaica, Ghana, and Mexico 1961-2018 (tons) (FAOSTAT).

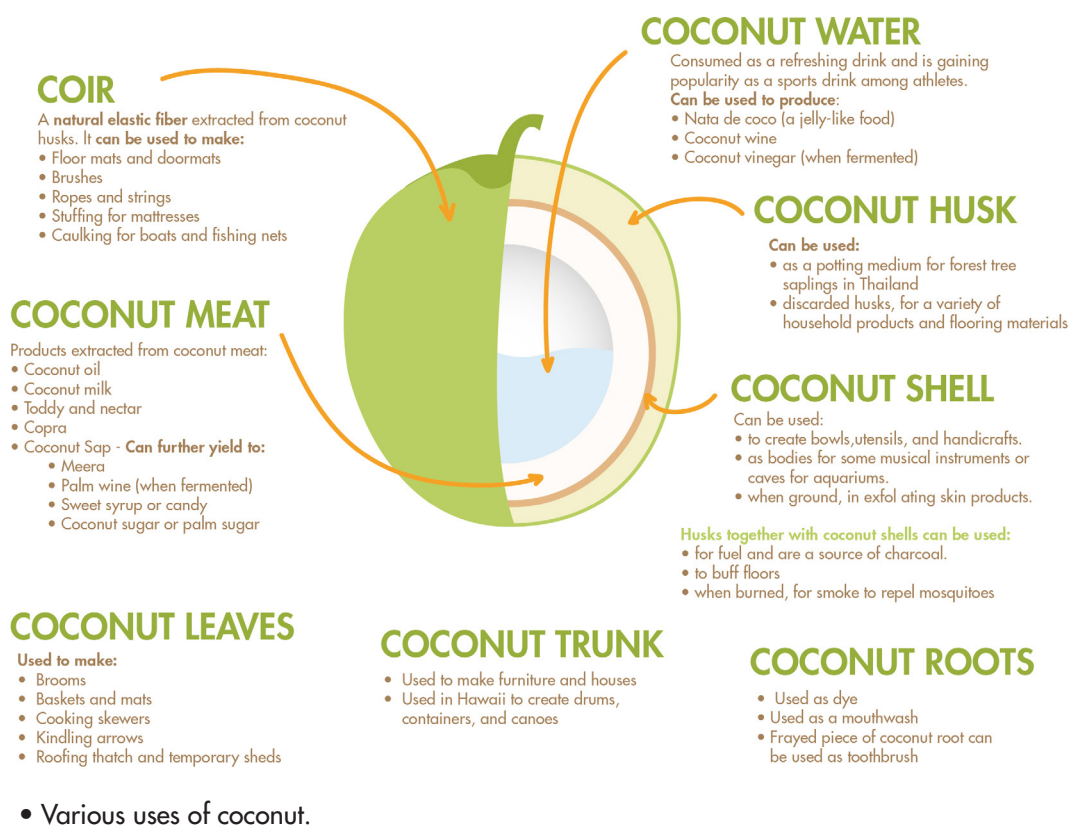
■ SCIENTIFIC DATA AND FIRST RESULTS

Socioeconomic consideration on the lethal yellowing on coconut agri-food chain

Coconut is a very important commercial crop in many tropical and subtropical countries, including Jamaica, Ghana, and Mexico, contributing significantly to their economies. Coconut flesh, indeed, can be used in the food, cosmetic and energy industries. The importance of coconut in each production country lies in several issues ranging from social, economic to environmental concerns. Coconut palms play a crucial role in local cultures, and coconuts provide livelihood security to millions of worldwide smallholders. From a more economic standpoint, coconut acquires substantial significance for rural employment and income generation. A crucial characteristic of coconut, indeed, is its capacity to create employment in marginal rural areas, where there are a few other opportunities. In this sense, and in determined local contexts, the socioeconomic cost of lethal yellowing is dramatic, considering the impact not only on the production, but also on employments loss. Finally, coconut plantations require low to no inputs and can provide wildlife and habitat conservation, contributing to carbon sequestration and preventing coastal erosion. In these circumstances, a systematic and timely pathogen detection becomes highly important for effective control and management of the disease. In the countries involved in TROPICSAFE, several management strategies are currently being implemented. In Ghana, the government has recently launched the Planting for Export and Rural Development (PERD) initiative by providing smallholders with hybrid coconut seeds, leading to improved yield. Jamaica is promoting many activities to reduce the spread of lethal yellowing and it is currently experimenting the cultivation of hybrids resistant to the disease. In Mexico, since 2016, lethal yellowing-resistant seedlings have been added to the coconut stock as recovery program of the Ministry of Agriculture.



The coconut tree bears the coconut fruit, which is used for nutrition, fuel, and shelter. Its cultivation is also one of the most sustainable practices on Earth.



KEY WORDS

Coconut, market, socio-economic aspects, lethal yellowing disease

FURTHER INFORMATION

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