

The intensive production of horn-type plantains (*Musa AAB*) with coffee in Colombia.

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PRODUCTION INTENSIVE DE PLANTAINS DE TYPE 'CORNE'
(*MUSA AAB*) ASSOCIES AU CAFE, EN COLOMBIE.

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RESUME - La Colombie est l'un des plus importants producteurs et consommateurs de plantains de type 'Corne' (*Musa AAB*) dans le monde. Environ 60 p. 100 de la production, soit 350.000 ha, sont associés au café. La production totale est d'environ 2.200.000 tonnes dont 50.000 tonnes sont exportées. La consommation per capita va de 80 à 300 kg pour quelques régions de campagne. Cette production est menacée par le *Cercospora* noir (black Sigatoka) présent actuellement dans la zone bananière de la Côte atlantique. La meilleure solution est de produire un type de plantain 'Corne' résistant à la maladie.

Colombia is the second largest producer of coffee in the world and has the highest per capita consumption of Horn plantains outside of West Africa. During the seminar on plantains held in Manizales in 1983, I observed the widespread interplanting of coffee and plantains in such a way that both crops were an inherent part of the agricultural economy over large areas. Although various varieties of dessert bananas, plantains, and cooking bananas are commonly planted with coffee in many countries, nowhere is the intensive cultivation of the Horn group of plantain varieties (*Musa AAB*) for mass consumption so closely linked to coffee production.

Production and consumption of plantains.

Colombia is undoubtedly the largest producer of Horn-type plantains outside of West Africa (4). Of the estimated 2,200,000 tons produced in 1983 all but about 50,000 tons are consumed locally (1). Of the 440,000 hectares of plantains 60% or about 360,000 ha are planted in association with coffee (2). This amounts to 1,320,000 tons or the equivalent of 110,000,000 bunches of 12 kg. The remainder is planted as a monoculture mostly in flat coastal areas below 500 meters. Most of the coffee-associated plantains are located between 500 and 1400 meters. Coffee is not planted above 1800 meters. The per capita annual consumption nationwide is estimated at 80 kg. However, in some rural areas average per capita consumption can reach

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Figure 1 - Fruit arrives at the Armenia plantain market in jeeps (upper) and small trucks (lower). Fruit is purchased by volume (jeep or truck load) and loaded into larger trucks for transport to the large cities such as Bogota and Medellín.



Figure 2 - (upper) Non-intensive, traditional cultivation of plantains with coffee and around bamboo used for construction and fence posts. (Lower) Subsistence cultivation of plantains with citrus, corn, and coffee around small farm houses.



Figure 3 - Intensive, modern systems of plantain cultivation in double rows with coffee.

160 kg and in localized areas 300 kg (2).

Production of plantains with coffee is concentrated in the Departments of Caldas, Quindio, Risaralda, Antioquia, Valle and Santander. Production is very intensive around the city of Armenia which has a unique market for Horn plantains (figure 1).

Varieties grown.

Three *Musa* varieties of the Horn-plantain group (AAB) are grown. «Harton» (Horn plantain), «Dominico Harton», and «Dominica» (French or Hembra). Harton with the fewest and longest fingers fetches the highest price. Dominico Harton which is intermediate in number and length of fingers between Harton and Dominica is the most popular variety grown with coffee.

Cultivation systems.

There are three basic cultivation systems in Colombia (Figs. 2, 3) : (1) intensive cultivation with coffee for sale to large urban markets (35%) ; (2) subsistence cultivation with coffee, citrus, cocoa, yucca, and in gardens around farm houses for mostly local consumption (52%) and intensive monoculture in wet coastal areas and alluvial valleys for export to the United States and Europe, and for the large urban centers in Colombia (13%).

With extensive cultivation in coffee there is usually no shade other than plantains which may be scattered throughout the coffee at populations of usually around 450 plants per ha and up to 1000 per ha. With intensive cultivation plantains are replanted every 6-10 years.

A system of maintaining plantains in double rows is preferred for ease of labor and management (Fig. 3). The double rows are 12.5 meters apart and planted at a 2 meter distance in the rows. Coffee is planted 1 meter apart between the plantain rows. This gives a population of 400 plantain and 7200 coffee plants per ha (3, 6).

Rainfall is from 2000 to 2500 mm per year and is well distributed. Plantains receive some fertilizer applied to the coffee.

Plant protection problems.

The main pests are the banana borer (*Cosmopolites sordidus*) and the burrowing nematode (*Radopholus similis*). However, insecticides or nematicides are rarely applied. The major diseases are yellow Sigatoka (*Mycosphaerella musicola*) and Elephantiasis.

There is no spraying for Sigatoka control. As a result, 3-4 of the oldest 8-10 leaves are heavily spotted in many areas. In areas where rainfall is more abundant all leaves have some spotting by harvest time. Studies at the University of Caldas indicated a reduction in yield from Sigatoka of about 30%.

Elephantiasis, the cause of which has not been determined, is prevalent and scattered over about 1500 hectares around Pereira. Mature plants and suckers die and a continuous program of replanting is necessary.

The threat of Black Sigatoka.

The rainfall patterns and prevalence of yellow Sigatoka in most areas indicate conditions are highly favorable for the development of black Sigatoka on plantains. Black Sigatoka was detected in September 1981 in the Urabá banana zone. Disease is now scattered throughout about 20,000 hectares of bananas and plantains in the banana zone around Turbo on the Atlantic coast. The disease is still in the consolidation phase, but will eventually spread throughout the plantain-growing areas of Colombia. Production will fall by at least 50% (7). In areas of higher rainfall, with no dry months in which foliage can be recuperated, Horn plantain production will probably cease.

The planting of plantains in double rows will facilitate spraying with motorized back-pack sprayers and is being promoted for this purpose.

DISCUSSION

The association of Horn plantains and coffee in Colombia has resulted from a combination of well-distributed rainfall over fertile soils mostly of volcanic origin. Plantains provide some shade and when planted in rows across the contours of steep slopes help to reduce erosion. Any reduction in coffee yield is more than compensated for by the value of the plantain crop, especially in these years of low coffee prices.

The coffee-plantain cultivation systems are threatened by black Sigatoka which will spread throughout Colombia in the next few years. The best long term solution to this threat is to support a program to breed disease-resistant plantains with the culinary traits of the Horn plantain varieties (5).

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