



CULTIVATION OF PLANTAIN AS A SHADE TREE IN ASSOCIATION WITH MAIZE AS A PRELUDE TO THE ESTABLISHMENT OF A COCOA FARM

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Context and Rationale

The CocoaSoils programme was initiated to address the problem of declining cocoa productivity and improve the livelihoods of producers while combating deforestation. The programme has two main components: Research for Development (R4D) and Partnership for the Dissemination of Research Results (P4D). R4D aims to generate new knowledge on best soil fertility management practices for sustainable cocoa production through long-term trials on cocoa mineral nutrition, while P4D aims to develop tools and strategies for farmer training. As part of the implementation of the R4D component, the National Centre for Agronomic Research (CNRA) is in charge of setting up a "Core trial" at the Divo/Côte d'Ivoire research station. The objective of this trial is to better understand the mineral nutrition and physiology of the cocoa tree on the one hand, and to develop an integrated soil fertility management method on the other hand, with a view to improving cocoa production in a sustainable manner.

Material and Method

Plant material

Corn (variety EV8766-SRMRP)
Banana (PITA variety)

Method

The trial was carried out over an area of 2 ha and subdivided into 88 plots of 15 m x 15 m. Each plot consists of 25 elementary plots of 3 m x 3 m. Before the trial was set up, a morphopedological characterisation of the plot was carried out, after which sampling of the 0-30 cm, 30-60 cm and 60-90 cm soil horizons was carried out. Maize was planted at a density of 80 m x 40 m (30800 plants per hectare). Bananas were planted at a density of 3 m x 3 m, i.e. 1111 plants per hectare. Mixed organic matter inputs (1/3 chicken manure, 1/3 rice husk and 1/3 compost): 4 kg per banana planting hole. Maize data collection consisted in counting the number of plants, the number of ears, measuring the maximum and minimum height of maize.

Results

The results of banana production showed that from the first to the second harvest we had a 20.40% increase in plots that produced at least one banana bunch. In terms of yield, a significant difference was observed between the two harvests; the second harvest had the highest yield (2189.1 Kg), a 48.78% increase compared to the first harvest. For maize, significant differences at the 5% threshold were observed between plots for each agronomic parameter (number of plants, number of ears, maximum and minimum plant height, weight of fresh ears, weight of fresh straw). However, we obtained an average of 100.38 plants/plot, 60.02 ears per plot and 8.7029 Kg/plot.

Table 1: Evolution of plantain production

Plot	Harvest 1		Harvest 2	
	Frequency	Percentage	Frequency	Percentage
No regime	47	53.41	29	32.95
Presence of regime	41	46.59	59	67.05

Table 2: Comparison of parameter averages agronomic efficiency

	Banana yield (Kg)
Harvest 1	1471.3 b
Harvest 2	2189.1 a
Average per harvest	1894.779
CV	278.2576
Pr > F	0.0008

Table 3: Comparison of the averages of some agronomic parameters of maize

	Number of maize plants	Maximum height (cm)	Minimum height (cm)	Number of cobs	Weight of fresh cobs (g)	Weight of fresh straw (g)
Average per plot	100.38	132.74	78.72	60.02	8702.9	5019
CV	64.98894	46.29981	67.41801	152.4726	98.75725	81,01
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

Conclusion

As the "Core trial" is ongoing, preliminary results have shown an increase in plantain production for the first crops. As for maize, in spite of its cultivation without fertilizers, we obtained on average on all the plots a good development of the plants in view of the agronomic parameters measured.

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