

Agroforestry Systems with emphasis in *Theobroma grandiflorum* cultivated in low fertility soils¹

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Introduction

The intense migratory flux that occurred to Rondonia state, Brazil, especially in the 70s and 80s, has caused intense deforestation, with the subsequent occupation of these areas with annual crops (rice, maize and beans), perennial (coffee and cocoa) and, mainly pastures. Part of the area that is utilized with annual crops is left under fallow for some years, with the objective of slash and burning in the future, and utilization with annual crops during a short period of time and, subsequently use with single perennial crops or pastures. This type of land use normally causes soil degradation, which is characterized by losses of organic matter and nutrients, as well as rapid weed infestation. Using these soils with agroforestry systems is a way of minimizing such effects. The objective of this research is to study appropriate agroforestry systems models for low fertility soils, as well as further our understanding of nutrient dynamics in these systems.

Materials and Methods

The experiment was installed in February 1987, in the Embrapa Rondonia experimental station located in Machadinho d'Oeste, Rondonia state. The coordinates of the local are 9°30' latitude south and 62° 10' longitude west of Greenwich. The climate is classified as Am, according to Koppen, with temperature and annual mean precipitation of 25.5 °C and 2400 mm, respectively. The region relief is flat and the altitude is 130 meters. The soil of the experimental area is a clayey oxisol, and the original vegetation was a primary equatorial forest.

The experiment is composed by the following treatments: 1) Brazil nut (*Bertholetia excelsa*) (12m x 12m), cupuacu (*Theobroma grandiflorum*) (6m x 6m), banana (*Musa sp*) (6m x 6m) and black pepper (*Pipper nigrum*) (6m x 6m); 2) Cordia tree (*Cordia alliodora*) (6m x 6m), cupuacu (6m x 6m), banana (6m x 6m) and black pepper (6m x 6m); 3) peach palm (*Bactris gasipaes*) (6m x 6m), cupuacu (6m x 6m), banana (6m x 6m); 4) Brazil nut (12m x 12m); 5) Cordia tree (6m x 6m) and 6) peach palm (6m x 6m). The experimental design is a randomized complete block design with four replicates.

Results and Discussion

Cupuacu production began three years after planting, harvest 1989/1990, increased until 93/94, drastically declining in the two following harvest, and increasing somewhat in 96/97. In the 97/98 harvest the production was intensively reduced (Table 1). The reduction was probably determined

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