

Development and Production of Several Tropical Species in Agroforestry Systems in the Brazilian Central Amazonia during Six Years

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In the Central Amazonia, large land areas nowadays are degraded and/or abandoned, which were previously used for shifting cultivation, pasture or monocultures. Agroforestry systems appear to be a good alternative to occupy these areas. The present study, carried out at the Embrapa Western Amazonia research station near Manaus, at 3° 8' 5" Southern latitude and 60° 01' Western longitude. The soil of the experimental site is a Xanthic Ferralsol according to the FAO/UNESCO system with a clay content of about 80%. It is acid with a very low cation exchange capacity and, in the natural stage, high aluminum saturation. The climate is to be characterized as Af (Rainy Tropical Climate) with an average of precipitation of 2606 mm/a.a., an average of relative humidity of 87% and an average of air temperature of 27 °C. The experiment has been installed in 1993 on area of about 14 ha and comprises 18 treatments, conducted as randomized complete block design with four replications in plots of 48 x 32 square meters. The treatments are different plantation systems, consisting of combinations of the factors species mixtures, fertilization level (30% or 100% of the dose recommended for each species) and inoculation of the seedlings with VA-mycorrhizal fungi. The agroforestry system were : System 1 – polyculture involving rubber tree (*Hevea brasiliensis*), peach palm (*Bactris gasipaes*) for heart palm production, cupuaçu (*Theobroma grandiflorum*) and papaya (*Carica papaya*); System 2 – polyculture with

peach palm, cupuaçu, Brazil nut (*Bertholletia excelsa*), urucum (*Bixa orellana*) and cassava (*Manihot esculenta*). The soil of the agroforestry systems is covered by kudzu tropical (*Pueraria phaseoloides*). For comparison, three monocultures were included in the experiment : cupuaçu, rubber tree and peach palm for palm heart production. Within this experiment, the development and production of several species was investigated. In field conditions, only papaya showed a significantly response to VAMF inoculation. On the other hand, the majority of the species also showed higher growth rates in the nursery when inoculated with VA-mycorrhizal fungi, and higher survival rates after planting out. Only papaya, cassava and urucum showed significant differences in production between the two levels of fertilization. The analysis between and within the systems for common species showed that the production of cupuaçu in the system 1 was significantly higher than in systems 2 and significantly higher in the two agroforestry systems when compared with the monoculture. For peach palm the results give evidence that the production in system 1 was slightly higher than in the system 2 and monoculture. Rubber tree shows a better development in agroforestry than in monoculture. Brazil nut showed slightly higher mean growth rates in the treatment with 100% fertilization than in that with 30% fertilization, but the difference was not significant.