

# Development and production of cupuaçu trees (*Theobroma grandiflorum*) in different cultivation systems performed on a former terra firme rain forest area: agro-ecological implications observed 1995-1997

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The cupuaçu tree (*Theobroma grandiflorum*) is grown throughout the Amazon region as part of orchards and small scale production systems. The relatively high market value of the fruit pulp and the potential use of the seeds for the production of chocolate-like wares make the cultivation of cupuaçu more and more attractive. This tendency causes an increasing demand of knowledge on the agro-ecological profile of this species.

We investigated the development and productivity of cupuaçu plants grown under different agro-ecological conditions as given by different cultivation practices. On a former terra firme rain forest area near Manaus 750 cupuaçu seedlings have been planted in three mixed cultivation systems differing in spacing and species composition, and one monoculture system. Beginning after 3½ years of cultivation the productivity of each single cupuaçu tree have been monitored during the harvesting seasons 1995/96 and 1996/97. The fruit production has been taken as measure to determine the maturity of the plants. From the adult plants those bearing 10 and more fruits per annum have been classified separately in order to register plants of advanced development.

Comparing the four cultivation systems after 3½ years [data after 4½ years in brackets] it becomes very evident that the mixed systems provide better conditions for a rapid development and production than the monoculture. The extremes are marked by the "mixed cultivation system 1" with 82% [88%] adult cupuaçu trees, 25% [31%] producing more than 9 fruits. In the monoculture, which was designed and handled according to common practices, only 16% [46,7%] of the plants entered the state of fructification, the tree with the maximum yield producing 3 [7] fruits.

The edaphic conditions vary considerably throughout the experimental site, some repetition blocks being characterized by a very low soil fertility. It is remarkable that the negative effects in those blocks were less evident in the "mixed cultivation system 1" (21% [11%] less adult plants than average of this system) than in the monoculture (90% [47%] less adult plants than average of monoculture).

We also observed a slight influence of the plants' distance to the adjacent forest on production and development: After 3½ years the development of cupuaçu plants was advanced near the border of the experimental site (88,4% adult trees; 12% producing more than 9 fruits). The amount of adult plants and those plants which produced more than 9 fruits decreased continuously towards the central part of the field (68,8% adult trees; 1,3% producing more than 9 fruits).

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