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Poster 11: Biomass Production and Mineral Element Supply of Selected Useful Tropical Plants

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This current investigation is part of a cooperative project of CPAA/EMBRAPA-Manaus and Hamburg University entitled "Recultivation of degraded and abandoned monocultures instable mixed cultures with special reference to soil biological factors". They are supported since 1992 by the BMBF-Bonn and the CMPq-Brasilia, and are embedded in the bilateral program "Studies on Human Impact on Forests and Floodplains in the Tropics" (SHIFT).

In this study the biomass product and the mineral element supply of selected useful tropical plants will be determined. Parallel to it the availability of nutrient element in the soil will be analyzed. These experiments may allow an evaluation, in which way a sustainable growth of the suggested plant system under the prevailing site conditions is possible. The experimental area with a site of 19 ha, is situated about 24 km from Manaus, and was established in September 1992 before burning an abandoned Hevea plantation there. For this study five species were selected for regrowth in March 1993: Swietenia macrophylla King (Mogno), Theobroma grandiflorum (Spreng.) K. Schum. (Cupuacu), Bixa orellana L. (Urucum), Schizolobium amazonicum (Parica) and Bactris gasipaes H.B.K. (Pupunha).

The biomass of the plants including the roots was determined gravimetrically. Up to 30 fractions (leaves, wood, bark etc.) were separated and in time series the alternations of the fractions were exhibited. The fractions allow a high differentiation of element content (Ca, Mg, K, P, S, N, Fe, Al) and reveal physiological sinks within the plants. The element content was determined by Optical Emission Spectrometry (ICP-OES), and for selected tissues on a subcellular level with EDXS (exception: N with Kjeldahl).

The biomass and the element content were determined for selected plants in September 1992 (before planting in the field) and in September 1994. Preliminary results are illustrated for Swietenia. In particular the data for Ca show that the mineral element supply at this experimental area has to be sustainably maintained, in order to guarantee in the long run an acceptable biomass production of highly valuable wood species (i.e. Swietenia macrophylla).

Key words: biomass production, mineral element supply, tropical plants.

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