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**Water and nutrient fluxes as indicators for the
stability of different land use systems on the
Terra firme near Manaus**

Annual Report 1998

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Water and nutrient fluxes as
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9) Soil nutrient amendment with leaves of varying quality

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The nutrient input by litter from different species in the experimental agroforestry system is very significant (Uguen & Silva Jr., 1998). Therefore, it is necessary to better understand the factors involved in the different steps of the nutrient transfer from litter to soil and the availability of soil nutrients. In soils with reknown nutrient limitations, we studied the impact of nitrogen and phosphorus fertilization combined with litter amendment on the microbial biomass of a xanthic Ferralsol (0-5cm and 10-20cm).

We used the leaf litter of five plant species *Bactris gasipaes* (PUP), *Bertholetia excelsa* (CAS), *Theobroma grandiflorum* (CUP), *Bixa orellana* (URU), and *Pueraria phaseoloides* (PUE) for an incubation experiment under a controlled moisture and temperature regime. Additional factors were the application of N and P fertilizer and soil with high and low organic C content. 100 g of air dried and sieved soil was incubated with 2 g of dried leaves. After 3, 6, 9 and 12 weeks, the soils were analysed for microbial C, N and P using fumigation extraction.

First preliminary results after 18 days of incubation are shown in Figure 1. Soils amended with P tended to have higher microbial C than soils fertilized with N or the control. This result indicates that nitrogen is probably not limiting microbial biomass growth the most, but rather P.

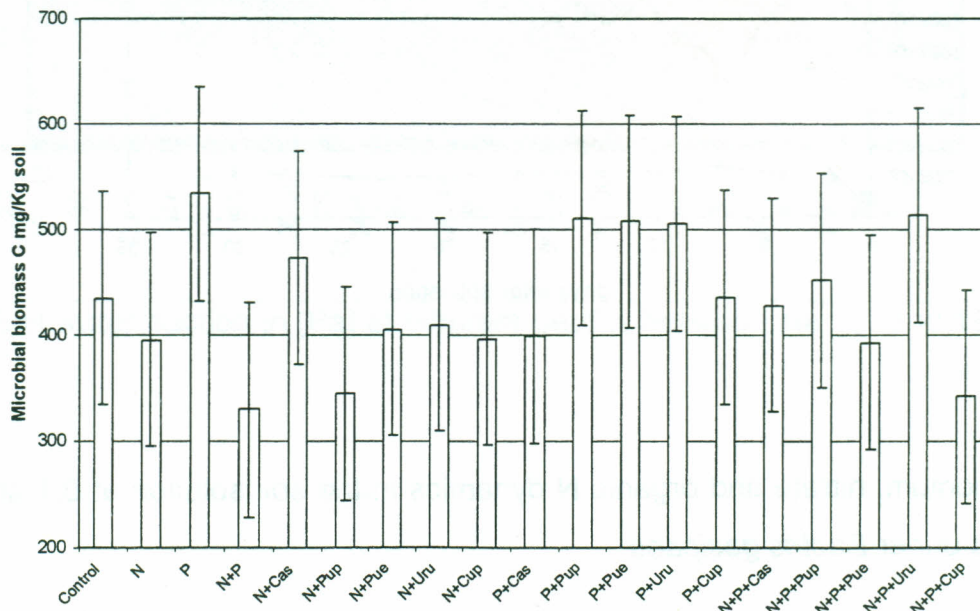


Figure 1. Effects of amendments of N, P and different litter types on microbial biomass carbon in soil