

Litter production and decomposition in an agroforestry system with perennial crops

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The objective of this ongoing study is to investigate the contribution of nutrients released from the above and belowground litter to crop nutrition and nutrient cycling in heterogeneous land use systems on infertile soils of the humid tropics. The field experiments are conducted in a polycultural system with two levels of fertilization (100% and 30% without nitrogen) and in a fallow. The system consist of *Bixa orellana* (Urucum), *Bertholletia excelsa* (Castanha), *Theobroma grandiflorum* (Cupuacu), *Bactris gasipaes* (Pupunha) and *Pueraria phaseolides* as a cover crop. The production of leaf litter of the trees is measured with litter traps centred on the trunk of the respective tree. The biomass and litter production of *Pueraria* is measured seasonally with the paired-plot method. The parameters chosen to describe the litter quality are the nutrient content (N, P, K, Ca, Mg) and the lignin and polyphenol contents. The decomposition rates of leaves and roots (1 to 2 mm) of each species of the system and of 2 frequent species of the fallow (*Clidemia hirta* and *Vismia guianensis*) are measured in the system without nitrogen fertilization using the litter-bag method. For Pupunha for palmito, the material studied for decomposition are the trunk and the fronds which are left on the ground after the harvest. For the different litters of the system, the mechanisms of nutrient release and especially nitrogen release are being studied by in vitro nitrogen mineralization assays and chemical characterization of the soluble fraction of the litter.