

Effect of mulch applications on macrofauna and decomposition in a degraded *Cocos nucifera* – *Theobroma grandiflorum* plantation in Central Amazonia

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Expecting that the increased input of plant residues in combination with different fertilizer input will increase the abundance and biomass of the soil macrofauna, and in consequence further lead to an increase of soil organic matter by a more stable decomposition process two, field experiments were initiated in 2001. The experimental plots are set up in a completely randomised block design in a degraded area of an abandoned *Cocos nucifera* and *Theobroma grandiflorum* plantation. A mulch treatment with three levels and a fertilizer treatment with two levels are combined in a factorial design with 2 replicates in each block.

In the first experiment grass is used as low quality litter material (nutrient poor). With the aim to raise the substrate quality (e.g. decomposability) leaves of *Flemingia macrophylla* are introduced in the experimental plots, while a mixture of both, grass and legume leaves, are used as medium quality.

In the second experiment, the influence of three different quantities of mulch material is tested, using branches including leaves of the legume *Tephrosia candida*.

The treatments in both experiments will be repeated every 4-6 months.

During the two years of experimental period, the nutrient content of the autochthonous and added litter as well as of soil samples will be analysed. Decomposition rates will be studied with litterbags installed in each treatment plot and retrieved every 3 months. Soil macrofauna was sampled at the beginning of the experiments and will be sampled again at the end of the experiments using large soil cores processed by Berlese Funnel Extractor. Soil samples will also give information on litter and root biomass as well as on soil organic matter content. The microclimate will be measured continuously by temperature and humidity loggers.

A Multivariate analysis of all measured variables will be used to get few integrating variables of soil fertility, which will then be used in a Two-Way-MANOVA to test the effect of the treatments on soil fertility.