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Book of Abstracts

1.7 Leguminous Cover Crops in Tropical Fruit Tree Production

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Leguminous cover crops have various effects on nutrient dynamics in tropical fruit production. These include: (i) fixation of atmospheric N_2 (ii) recycling of nutrients, and (iii) soil conservation against water and wind erosion. This contribution is intended to demonstrate the effects of *Pueraria phaseoloides* on nutrient availability in fruit tree production in the humid tropics. Above-ground nitrogen accumulation in *pueraria* was 8 and 14 times higher in intercropped *Theobroma grandiflorum* (cupuaçu; juice production) and *Bactris gasipäes* (palm of heart production), respectively. Biomass production of *pueraria* was even 28 and 10 times higher in *T. grandiflorum* and *B. gasipäes*, respectively. Even without accounting for production, above-ground recovery of applied ^{15}N in *pueraria* was as high as in *Theobroma* and 4 times higher than in *Bactris*, and led to less leaching of applied ^{15}N and higher ^{15}N contents in the topsoil. Furthermore, the biological nitrogen fixation of *pueraria* reached values from 9 to 45 % depending on the season. As a result, total soil nitrogen contents significantly increased and the light organic matter fraction of the soil was significantly enriched with nitrogen. The foliar ^{15}N values of the fruit trees were lower with a higher *pueraria* abundance indicating a transfer of biologically fixed nitrogen The amount of transfer, however, was negligible and needs to be increased by appropriate management, e.g. closer tree spacing. For other nutrients than nitrogen which cannot be supplied by *pueraria* from external sources like phosphorus, care has to be taken that the cover crop does not sequester nutrients. Thus, foliar phosphorus contents of *Paullinia cupana* (guarana; juice production) decreased by 13 % if associated with *pueraria*. In conclusion, research needs are specified in terms of improving services of leguminous cover crops for better fruit tree nutrition.