

Quantification of biological Nitrogen fixation in primary forest and secondary vegetation in NE Amazônia

Antje Thielen-Klinge¹, Lubica Paparcikova², Manoel dos R. Cordeiro² and Paul L.G. Vlek¹

¹Institute of Agriculture in the Tropics, Göttingen, Germany

²EMBRAPA Amazonia Oriental, Belém, Brazil

The fluxes of nitrogen in tropical moist forests are poorly quantified, due primarily to the lack of suitable techniques allowing accurate estimation of inputs through biological nitrogen fixation or losses through denitrification. We present evidence of the absence of symbiotic nitrogen fixation by selected leguminous trees in a primary forest that apparently turn into active N fixers following slashing and burning. $\delta^{15}\text{N}$ data from leaves and litter of secondary forests at various degrees of development showed an abrupt drop in $\delta^{15}\text{N}$ values after burning followed by a gradual increase until these values approached those of the underlying soil as the forest matured. These findings point to a gradual loss of rhizobial fixation activity as the N cycle in the growing forest gradually is closed, possibly regulated by the N enrichment of the forest soil over time.

Mailing address:

¹ Grisebachstr.6, 37077 Göttingen, Germany, E-mail: athiele@gwdg.de

² EMBRAPA Amazônia Oriental, Trav. Eneas Pinheiro, S/Nº, 66.095-100 Belém-Pa, Brazil; E-mail: lpaparc@ufpa.br