

Use of non-destructive methods for the determination of above- and below-ground net biomass productivity of secondary forests

Cattânio, J.H.¹, Kanashiro, M.¹, Sá, T.D.A.¹, Vielhauer, K.²

¹ EMBRAPA Amazônia Oriental Belém-Brazil, ² Institute of Agriculture in the Tropics Göttingen-Germany

In the process of bringing land under agricultural utilization in Eastern Amazonia large areas of primary forest have been converted into secondary vegetation. The predominant shifting cultivation system bears the secondary vegetation (capoeira) as a fallow component within its cycle. This makes it an important contributor to restoring soil productivity. One important parameter to look at the restoration capacity is the accumulation of secondary vegetation biomass over time. Direct measuring techniques of biomass are labour intensive and costly, which is why methodological work has to be done to find easier ways of determining above- and below-ground biomass indirectly to quantify the ecosystems productivity.

In the current study leaf area indices (LAIs) of three different capoeiras (1 year old, 6 years old, 10 years old) are being measured in the field with a Licor LAI 2000 and a calibration is done destructively at the end of the experiment to calculate to true total leaf area. These data, taken at given time intervals, are being correlated to root growth indices (root surface per unit soil volume of ingrowth bags) once in the rainy season and once in the dry season.

So far, the preliminary results show a seasonal fluctuation of LAIs for all three capoeiras, which are more expressed in the two younger capoeiras. They are high (3-5) during the rainy season and drop to 2-4 in the dry season. Moreover the 1-year-old and the 6-year-old capoeira have similar LAIs (around 3) whereas an expressed increment can only be observed in the 10-year-old capoeira (4-5). The preliminary results of the root measurements show a intensive growth in deeper soil layers (below 1 m) during the dry season.

The current work is still under way and will deliver data of the rainy season at a later stage.

Mailing address: ¹ and ²- EMBRAPA Amazônia Oriental, Trav. Dr. Eneas Pinheiro s/n, 66.095-100 Belém-PA, Brazil, E-mail: milto@cpatu.embraba.br