

Floristic composition dynamics of enriched secondary vegetation in Eastern Amazonia

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The effect of enrichment plantings with five leguminous tree species (*Acacia mangium*, *Acacia angustissima*, *Inga edulis*, *Clitoria racemosa* and *Sclerolobium paniculatum*) on the natural secondary vegetation was studied on a terra-firme site near Belém-Pará, Brazil. The trees were planted in 1995 during the last part of the cropping period to enrich the traditional fallow vegetation in the slash-and-burn land use system. The spacing was 1m x 1m, 2m x 1m and 2m x 2m.

In 1996, one year after planting, the first vegetation analysis was carried out. A total of 274 species of 73 plant families were registered. The total plant cover on the studied plots was increased only by *Inga edulis* (1m x 1m, 2m x 1m) and *Acacia mangium* (1m x 1m). However, all enriched plots showed a reduced cover by the spontaneous undergrowth of between 25-79 %, due to the competition of the planted leguminous trees. This effect was very distinct with the 1m x 1m spacing. In *Inga edulis*-, *Acacia angustissima*-, *Acacia mangium*- and *Sclerolobium paniculatum*-plots the share of cover by growth forms such as trees and woody lianas was between 7-33 % higher than on the control plots. Thus, the enrichment of the fallow vegetation with fast growing leguminous trees leads to a short-cut of the secondary succession by skipping the herb and grass phase.

In 1997 a second vegetation analysis was carried out and only 159 different species of 57 plant families could be found. Especially the remaining herbs and grasses had disappeared due to the natural succession. A lower number of species was observed within 1m x 1m spacing than on the control plots. Species diversity calculated with the Shannon-Wiener index also decreased compared to 1996. On average, the cover of the secondary vegetation in control plots (155 %) was higher than for the undergrowth of the planted leguminous trees. Dense spacing (1m x 1m, 2m x 1m) of *Inga edulis* caused a reduction in the cover of secondary vegetation of between 57-62 % (in *Acacia mangium* 40-60 %, in *Acacia angustissima* treatments 21-40 % and in *Sclerolobium paniculatum* treatments 46 %).

Thus, in a short run, the growth forms of the earlier successional stages (herbs and grasses) are being reduced due to changed ecophysiological conditions under the canopy of the fast growing introduced trees. In the long term, however, the tree and shrub diversity in the advanced successional stages of the natural secondary vegetation is endangered due to the strong competitive power of the planted leguminous trees.

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