

Spectral distribution of light in spontaneous and enriched fallow vegetation in NE Amazonia

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In secondary vegetation under fallow, the successional process is closely associated to light quality, and any attempt to manipulate vegetation (e.g. enrichment plantings to improve fallow vegetation) should take into consideration how the proposed changes in vegetation structure and composition will affect the light climate, mainly near the ground, where seedlings and sprouts of indigenous species start to grow. To support the assessment in an experiment with improved fallow vegetation in Northeastern Pará State, Brazil, light spectral composition (330nm to 1100nm) was monitored during four periods (November 1996, January, June and October 1997) in the following stands: 6 to 7-year-old fallow, 1.5 to 2.5-year-old fallow, and finally 1.5 to 2.5-year-old fallow stands which were enriched with fast growing nitrogen fixing leguminous trees (*Acacia mangium*, *Acacia angustissima*, *Clitoria racemosa*, *Inga edulis*, *Sclerolobium paniculatum* and a mixture of these trees. Measurements were performed at two heights (ground level and 1 m) in all plots except in the oldest vegetation, where measurements were taken at six heights. The analysis was centered on three light quality parameters associated to: photosynthetic active radiation, PAR (400nm to 700nm); phytochrome active radiation, PHYTAR (represented by the Red : Far Red ratio); and blue active radiation, BAR (400nm to 500nm). Both PAR and BAR were computed comparing the energy reaching inside each studied plot to the energy above the canopy. A sharp decrease on values of the three studied parameters was observed in all enriched plots, from November 1996 to January 1997, associated to the fast canopy growth observed with the planted trees at the onset of the rainy season. The lowest values for all three parameters for most of the plots were found during June 1997, when the planted trees and the indigenous species were very leafy. Reflecting the lack of rainfall during the second semester of 1997, the values for all parameters were greater during October 1997, as a consequence of the increased canopy openness due to drastic leaf fall.

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