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Transformation of Coffee Plantations through Tropical Timber Production in the Region of Soconusco, Chiapas, Mexico

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Abstract

The Soconusco, one of the most important coffee producing areas in Mexico, is passing through a transformation process due to the coffee price crisis. The transformation of the coffee agro-ecosystem by timber production is considered as a suitable and sustainable alternative, which is adapted to the fragile ecophysiological conditions of the Soconusco promontories. To document the transformation process from coffee to timber production and to advance the knowledge about the local growth rates of tropical timber species this study has been carried out between August and November 2006, on a former coffee producing farm, which is located in the vicinity of Tapachula in the Vega de los Gatos (15°01'40.5'' north latitude, 92°14'10.2'' west longitude and between 392 and 565 m.a.s.l.). The field study was carried out with four different timber species: *Acrocarpus fraxinifolius*, *Cedrela odorata*, *Swietenia humilis*, *Tectona grandis* and *Khaya senegalensis*, which were planted between 2003 and 2006. The experimental design consists in one systematic structure including five plots (32 × 88 m) measuring 12 plants each. Measurements of tree height and diameter (D.B.H.) have been realised two times, to show the growth rates and to document the changes of the ecosystem structure in horizontal and vertical distribution, as influenced by site-specific factors and time. To demonstrate the influence of ecological conditions on different tree species the biodiversity of soil cover was analyzed. Teak presents together with *Khaya* the highest potential in increasing plant height and stem diameter. The growth of *C. odorata* was not so easy. Plant biodiversity assessments were carried out, by documenting the most frequently appearing plant species on each experimental area. Biomass production of the living soil cover and litter oscillate between 5475 and 6925 gm⁻² in 4 years old forest and between 5188 and 7380 gm⁻² in one years old forest. Dicotyledons species were more dominant than monocotyledonous species and fine litter smaller than coarse litter.

Keywords: *Acrocarpus fraxinifolius*, *Cedrela odorata*, growth rates, *Khaya senegalensis*, soil cover, *Swietenia humilis*, *Tectona grandis*