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

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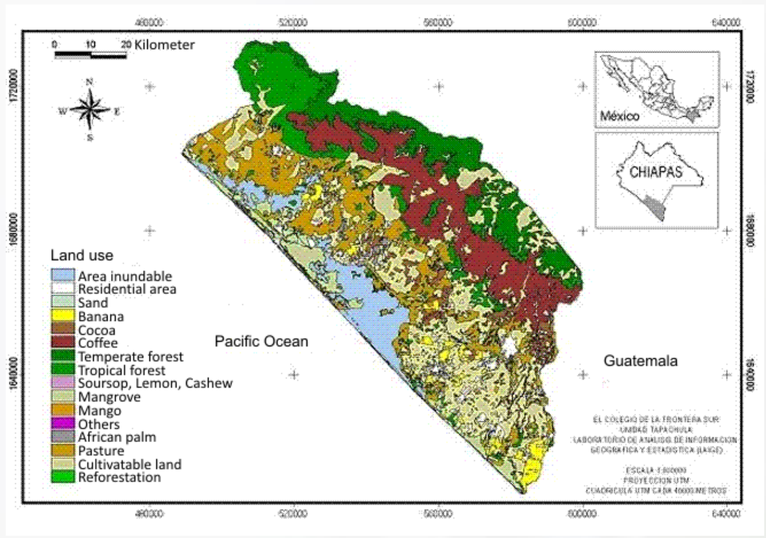
Introduction

Due to the low coffee prices, coffee farmers from emerging countries are in a bad economic situation. The adaptation to the new conditions of the world market requires a transformation of the cultivation in the Soconusco. The goal must be to create social and ecological contractual cultivation systems, which protect the diversity of species of flora and fauna, the water catchment basin and the soil of the fragile ecological system. Above all, it should guarantee its economic profitability ([1,2]).

Research area



Research Approach

Document the transformation process from coffee to timber production as well as the growth rates of tropical timber species in the Soconusco

Materials and Methods

This study has been carried out between August and November 2006, on a former coffee farm, located in the vicinity of Tapachula in the Vega de los Gatos (15 01 40.5 N, 92 14 10.2 W and between 392 and 565 m.a.s.l.). Five different timber species, ***Acrocarpus fraxinifolius, Cedrela odorata, Swietenia humilis, Tectona grandis*** and ***Khaya senegalensis***, were planted between 2003 and 2006. The completely randomized design consists of 18 fields allotted to the five species. Within each field a five row-plot (32 x 88 m) of 5 x 12 plants was measured. Tree height and diameter (D.B.H.) were measured twice, 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 over time.

T. grandis 16 months after planting.

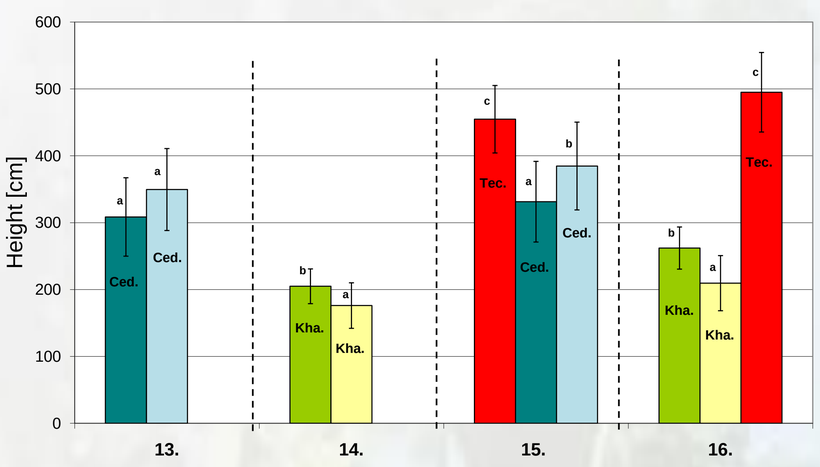
Pruned 28 months old *S. humilis* plantation.

Results and Discusion

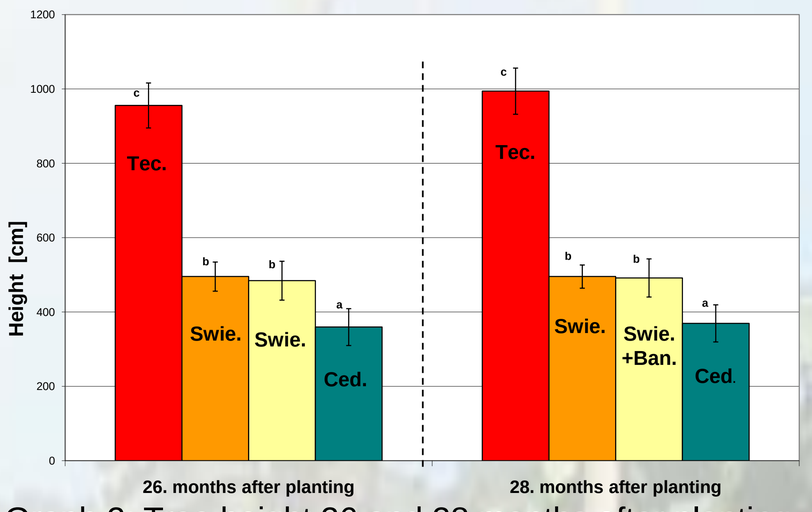
Timber species	Soil Cover [g]	
Cedrela odorata	5475,0	a
Tectona grandis	5755,0	a
Acrocarpus fraxinifolius	6925,0	a
Method: 95,0 % LSD		

Tab. 1: Influence of the timber species on the soil cover biomass 37 months after planting

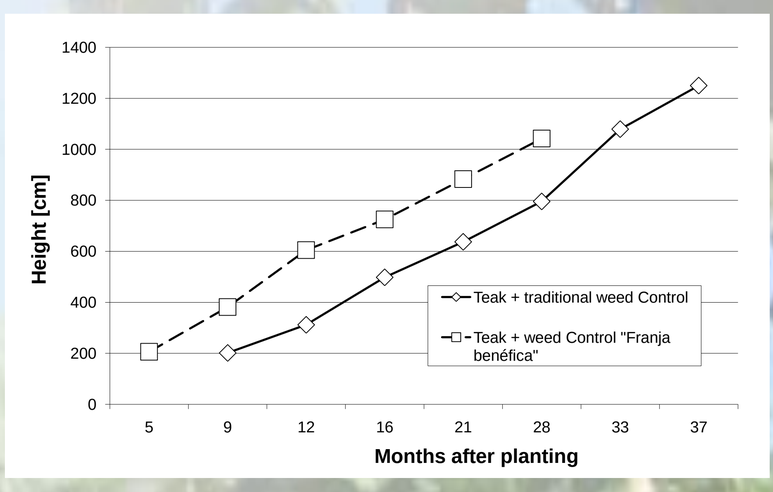
There is no significant influence of the timber species on the soil cover biomass (coarse litter, fine litter, monocot., dicot. plants) four years after planting.



Graph1: Tree height 13 till 16 months after planting



Graph 2: Tree height 26 and 28 months after planting



Graph 3: Development of the tree height of *Tectona grandis* under different management systems

- Tree height of *Tectona grandis* 16 months after planting is 495 cm and is significant higher than *Khaya senegalensis* .
- In 28 months old plantations tree height of *T. grandis* is with 994 cm significant higher than *Swietenia humilis* and *Cedrela odorata*
- The tree high from the plantation under “Franja benéfica” weed control system was all times superior the traditional system

Conclusion

- Tropical timber production has a high potential for the promontories of the Soconusco.
- For the transformation of the coffee agro-ecosystem to timber production the system of the “Franjas benéficas worked satisfactorily.
- Due to its ecological sustainability, this system affects positively growth and the vitality of the forest trees and guarantees also low operating costs.

References:
[1] Barrera J., Parra V., Herrera H., Jarquín G. and Pohlan J. 2004. Plan Rector para el Manejo Agroecológico del café en Chiapas. ECOSUR y la Comisión para el Desarrollo y Fomento del Café de Chiapas. Informe técnico. Noviembre de 2004. Tapachula, Chiapas, México. p. 236.
[2] Pohlan J., De Edelmann A., Giesemann, B., Gramlich, A., Fernández, B. und Pohlenz B. 2004. Experiencias y ejemplos sobre la transformación de zonas cafetaleras en el Soconusco, Chiapas, México. CD Memorias Convención TROPICO 2004, Cuba.
Photos : Thomas, 2006.