Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Macaw Palm (*Acrocomia aculeata*) – A Minor Crop of the Neotropics with High Bioeconomic Potential

Thomas Hilger[1], Johannes Mössinger[1], Talita Oliveira de Araújo[2], Eric Dolch[1], Isabella Kremer[1], Catherine Meyer[1], Daniela Haupenthal[3], Sérgio Motoike[2], Georg Cadisch[1]

[1] *University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany*
[2] *Federal University of Viçosa, Department of Plant Science, Brazil*
[3] *Universidad Católica del Paraguay, Campus Itapúa, Paraguay*

Abstract

Rich in biodiversity, the neotropics host huge resources for food security and income generation. Macaw palm (*Acrocomia aculeata*) found from Mexico down to Argentina is one example with excellent bioeconomic potential. It has manifold uses, e.g. food specialties, fodder, fiber or medicine. Its main product, however, oils from fruit pulp and kernel may boost its importance, as it is an economic, sustainable and environmental friendly alternative to *Elaeis guineensis*, adapted to less fertile soils and less favourable environmental conditions. We studied growth and light interception in sole and mixed cropped pioneer plantations in Paraguay. Aboveground biomass (5.6, 12.3, 19.1 Mg ha^{-1}, resp.) and leaf area index (0.32, 1.09, 1.49, resp.) increased with age (29-, 69-, and 88-month-old), whereas light transmission (78, 41, 32 %, resp.) decreased. In the oldest stand, photosynthetic active radiation penetrating through the canopy still reached up to 1000 μmol m^{-2} s^{-1} during 8.30 a. m. and 3.30 p. m., allowing to grow food crops below the canopy of macaw palms, an interesting option for peasant farms. Root observations also showed that their distribution is favourable for intercropping with other crops. First whole-farm-mathematical-modelling results from East-Paraguay indicate cropping potentials, especially for peasant farmers agroforestry systems. Currently, macaw palms start flowering after 48 months, producing fruits up to 70 years and more. Fresh fruit yields are around 22 Mg ha^{-1}, providing up to 3.3 Mg ha^{-1}of kernel and pulp oils, being high for a hardly domesticated species. Its composition of fatty acids with a share of essential fatty acids up to 60 % being higher than that of *E. guineensis*. Macaw people has the additional advantage that its fatty acid composition alters with the ecological conditions under which it grows. Hence, it is highly flexible in its application. In addition, they are rich in tocopherols and carotenoids. Finally, there is need to identify the best accessions for each ecological condition under which it grows to develop varieties tailored for specific applications in bioeconomy

Keywords: Agroforesty systems, farm modelling, multi-purpose applications

Contact Address: Thomas Hilger, University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Garbenstr. 13, 70593 Stuttgart, Germany, e-mail: thomas.hilger@uni-hohenheim.de