Changing the slash-and-burn agriculture in Brazilian Eastern Amazonia by enriching the fallow vegetation

Silvio Brienza Jr.[1], Konrad Vielhauer[2], Manfred Denich[2] and Paul L.G. Vlek[2]
[1]EMBRAPA Amazônia Oriental, Belém-PA, Brazil
[2]Institute of Agriculture in the Tropics (IAT), University of Göttingen, Germany

Most of the agriculture in the Eastern Amazon region of Brazil involves slash-and-burns with cropping for one to two years, followed by fallow periods among three to eight years. During the fallow period a spontaneous secondary vegetation or "capoeira" grows up which contributes to the maintenance of the system´s productivity through biomass and nutrient accumulation. In places of high demographic pressure the fallow periods are short and there is not enough time to the soil recovers its fertility for the next cultivation cycle, resulting in a decrease of the agricultural productivity. To overcome this problem and in order to shorten the fallow period by improving the vegetation´s vitality and its biomass accumulation it was evaluated the performance of fast growing leguminous tree planted associated with the annual crops maize and cassava.

On an on-farm experiment in Igarapé-Açu (Northeast of Pará) the following leguminous tree species were planted: *Acacia angustissima*, *Acacia mangium*, *Clitoria racemosa*, and *Inga edulis* at densities of: 1 m x 1 m, 2 m x 1 m and 2 m x 2 m. The experimental plot size was 10 m x 8 m and the treatments are arranged in randomized blocks with four replications.

Planting the trees into the standing cassava crop resulted in a rapid development of the trees after cassava harvest and accelerated biomass production. Cassava yield was not influenced negatively by the tree growth. Neither were the trees affected by the crop. Survival rates of the trees were more than 90% for all planted species. The shading by the cassava plant assured good establishment and controlled tree growth to a permitable extent as long as the crop were still in the field. According to the *A. mangium* performance it is possible to estimate that after 30 months the above-ground biomass it will be approximately equivalent to 4-5-year-old "capoeiras".

Mailing address: [1]EMBRAPA Amazônia Oriental - Cx. P. 48, 66095-100, Belém-Para, Brazil; [2]Institute of Agriculture in the Tropics - Grisebachstr. 6, D-37077, Göttingen, Germany; e-mail: sbrienz@gwdg.de