

The development of mulching- and secondary vegetation enrichment technologies and first steps to participatory on-farm research in NE Amazonia

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The present work is an overlook of the second phase of the project ENV 25 conducted in Eastern Amazonia, in a region largely deforested and dominated by subsistence food crop production of smallholders using the shifting cultivation system. Traditionally, slash-and-burn is being used as a land preparation means and the fallow periods are left to growth of spontaneous secondary vegetation (*capoeira*). Soil degradation has reduced productivity considerably. Together with growing population pressure this leads to an expansion of the cropped area within the limited total farmland of 25 ha, thus, accelerating the crop-fallow cycle in an unfavorable manner. The projects objectives are to break the vicious circle i) by reducing or stopping land degradation using fire-free land preparation and ii) by increasing crop productivity per unit area admitting the shortening of the fallow period. These two objectives lead to the development of the following technologies:

- 1) Mulching practice: Slash, chop and distribute the vegetation material in a feasible mechanized manner with the following effects: Maintains organic matter and nutrients, gains flexibility in planting date due to independence of dry season for burning and water conserving mulch layer, requires adapted fertilization due to slowly releasing nutrients as opposed to ash fertilization, requires crop varietal selection and adaptation to low pH conditions, facilitates weeding practice due to a better weed suppression (especially Gramineae) by the mulch layer, enhances resprouting of the non-burned shrubby vegetation.
- 2) Tree enrichment: Plant fast growing tree legumes at the beginning of the fallow with the following effects: supports biomass production of secondary vegetation; provides wood for stakes, building material, and charcoal; requires good choice of legume tree species (indigenous and introduced) and planting densities for best balance between biomass accumulation, nitrogen fixation, maintenance of biodiversity, deep rooting capacity, and decomposition quality; requires access to planting material (seed production, seed storage, nursery), requires management skills to decide on planting density and planting date of enrichment trees, to avoid competition with crops.

Most of the above mentioned activities are currently being conducted as researcher managed on-farm field experiments. An increasing farmers participation is being promoted for the future, to be guided towards farmers needs more effectively. An agro-socio-economic field study in collaboration with ENV 44, conducted recently, will give the required baseline data for the participatory effort.

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