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Viability of Mechanized Chop-and-mulch as a Soil Improving Alternative to Manual Slash-and-burn Land Preparation

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As alternative to slash-and-burn land preparation there are a number of technologies offered at present. Most of these technologies, however, imply essential changes of the customary cropping systems including often even the replacement of the traditional crop species. As a result the slash-and-burn practice can be reduced by introducing forms of permanent or semi-permanent land uses, such as employing perennial crops or tree species to substitute annual crops and hereby reduce the number of fallow periods. However, there is a way to remove the fire from the system entirely, whilst maintaining traditional cropping habits and fallow periods. We present an alternative to slash-and-burn, which does not entail any change of the farmer's choice of crops nor their planting arrangement nor their planting time. Instead of limiting, the technology rather permits greater liberty of choice of these factors. This is done by only replacing the fire as a tool of land-clearing. A tractor driven bush chopper cuts and chops the fallow vegetation in one go and leaves the chips on the ground to form an easily decomposable mulch layer into which any crop can be planted immediately afterwards, providing some mineral fertiliser to overcome initial nutrient immobility. Since this new technology, which we call chop-and-mulch, implies mechanisation and thus a considerable investment at some point, it is of great interest to learn more about its viability to the farmer. Apart from the fact that return on land and labour prove to be higher as compared to slash-and-burn, there are a number of other advantages, such as free choice of planting date due to uncoupling of the dry season that is necessary for the burning and increased rural labour demand due to greater yield-connected activities. The greatest advantage of chop-and-mulch in terms of adoption potential, however, lies in its reversibility, i.e. the fact that the new system can be abandoned at any time the farmer decides. Not being necessarily locked to the technology for too long a time period is probably the biggest asset in comparison to some other technologies that are being offered to avoid slash-and-burn.

Keywords: Brazil, bush-fallow, eastern Amazon region, mechanisation, mulch, secondary vegetation, shifting cultivation

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