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Comparing Slash-and-burn and Slash-and-trituration/mulch as Land Preparation for Pasture Establishment in Brazilian Eastern Amazon: Soil Humidity

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Abstract

Land preparation is an important factor for land-use sustainability in tropical forest areas. For the last ten years the Embrapa Amazônia Oriental research centre has tested slash-and-trituration/mulch (STm) of secondary vegetation as a new method of land preparation before planting crops and pastures in Northeastern Pará, Brazil. Besides avoiding the negative impacts of fire of the traditional slash-and-burn (SB), the STm method might also improve soil humidity favouring plant growth. This study compared the impact of both methods of land preparation on the dynamics of soil humidity on a sandy Latossolo Amarelo under pasture use in the municipality of Igarapé-Açu (01° 06' S and 47° 31' W). The predominant climate is hot and rainy, with a dry season from September to December, annual temperature from 25 to 27°C and average annual precipitation of 2,500 mm (Am type of climate). An area of 4.8 ha covered by a 10-year old secondary vegetation (capoeira), with a biomass of 74 t MS ha⁻¹ was divided in two similar parts, one was slashed and burnt in December 2000, and the remaining part was cut and mulched with an AHWI bush chopper in February 2001. In March 2001, a *Brachiaria brizantha* + *B. humidicola* pasture was planted in both areas. After the pasture establishment, both areas were grazed by steers in a rotational system (18 days of grazing, 36 days of rest, three paddocks). From September 2003 to June 2004, every 15 days humidity (gravimetric method) was measured in five soil layers, 0-5; 5-10; 10-20; 20-40; 40-60 cm, at two randomly selected points of each paddock. The available forage mass was measured every 36 days. It was observed that, in comparison to SB, the STm method increased soil humidity during the study period, mainly in the upper soil layers (0-5; 5-10; 10-20 cm), corresponding to an increase in forage mass. The results indicate a potential advantage of agricultural practices that avoid the use of fire in land preparation.

Keywords: Amazon, land preparation, mulching, pastures, secondary vegetation, slash-and-burn, slash-and-trituration, soil humidity

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