

# ORGANIC MATTER AS AFFECTED BY CONSERVATION AGRICULTURE OF CASSAVA AND MAIZE CULTIVATION IN AN ACRISOL FROM SOUTHWESTERN BRAZILIAN AMAZON

AUTORES: DEBORAH PINHEIRO DICK, ITAUANE OLIVEIRA AQUINO,  
FALBERNI S. COSTA, CARLOS TADEU S. DIAS  
E-mail: debby.dick@gmail.com

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Resumo: In the Brazilian Southwestern Amazon, food security agriculture predominates in smallholder farms where cassava cultivation is conducted under conventional tillage (CT). We investigated the impact of conservation agriculture on soil C content and organic matter (SOM) composition in an Acrisol (Acre State) cropped with cassava and maize. Management systems (phosphorus fertilization, liming, and cover crops of legume and of legume+grass (introduced at the 9<sup>th</sup> year) under CT and no-tillage (NT) were compared in a split plot design (3 repetitions). Samples from the treatments and from an adjacent native tropical forest (reference) were collected from 6 layers down to 1 m, on the 10<sup>th</sup> and at the 13<sup>th</sup> year after experiment implementation. C and nitrogen (N) contents were determined and SOM was investigated by  $^{13}\text{C}$  isotopic signature,  $^{13}\text{C}$  NMR spectroscopy, and n-alkanes determination. Effect of conservation system on C concentration was detected only at the second sampling, evidencing the importance of the consortia legume+grass as cover crops in contributing to C reservoir in a tropical climate. However, mobilization of the endogenous SOM was verified under CT management systems without a concomitant soil C content alteration. The introduction of agriculture, regardless of the management system, affected SOM in the first 5 cm promoting an increase of the O-alkyl and a decrease of alkyl groups in the SOM chemical composition. Furthermore, an increase in microbial-derived n-alkanes and in the degradation of vegetal-derived n-alkanes was observed. In the time frame of 10 years, change in land use in this hot and humid environment was more influential on the SOM quality than the conservation management system.