

SOIL ENZYME ACTIVITY IN CONSERVATION SYSTEMS IN THE SOUTHWESTERN BRAZILIAN AMAZON

AUTORES: FALBERNI DE SOUZA COSTA, MARIA CLARA ARAÚJO DE AVILAR AMANCIO, IEDA DE CARVALHO MENDES

E-mail: falberni.costa@embrapa.br

Palavras-chave: No-tillage; zero fire; sandy soil; β -glucosidase; arylsulfatase.

Órgão financiador: Agrisus Foundation

Resumo: Conservation agriculture in family production in the sandy soil of Mâncio Lima municipality, western Acre State, has a positive effect on its biological attributes. This hypothesis is being tested in a long-term experiment (2006-present) for the enzyme activity associated with the carbon (β -glucosidase) and sulfur (arylsulfatase) cycles and its relationship with the increase in soil organic matter (SOM) content and with agricultural productivity. The experimental design is a randomized block with three repetitions, applied in a scheme of splitplots for tillage and cropping systems on a sandy Acrisol. No-tillage (NT) and conventional tillage (CT) of the region (plow harrow) are in the main plots and the cropping systems (witness - T, legume-grass cover crops - LG and LG with phosphorus and lime - LGPC) are in the subplots, with added technology in the order NT>CT and LGPC>LG>T. Soil was collected in the local summer (2021, October), after the harvest (2021, August) of cassava, crop 2020/2021. Plant residue burning in T has been performed as usual in the region and no longer used in LG and LGPC since 2006. T was also burned in 2021, October. Enzyme activities were tested at their optimum pH values in duplicate with a control. After 15 years, SOM content was similar between treatments, although crop productivity more than doubled in NTLGPC. NT and CT ($p = 0.15$) and crop systems ($p = 0.35$) were statistically similar for arylsulfatase and β -glycosidase ($p = 0.961$ and $p = 0.927$, respectively). Although without statistical significance, the absolute values of arylsulfatase activity were 32.60% higher in the NT compared to the CT. Our results highlight the difficulty of increases in enzyme activity levels and SOM contents in tropical Amazonian environments. The results are from the first soil sampling within the ongoing research schedule, and are unprecedented for the western region of Acre, with their variations reflecting the composition of the treatments in the experiment.