

The decomposition of sugarcane residue improves the chemical and microbiological soil attributes

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Sugarcane is one of the most important crops and is a raw material for sugar production and source of renewable energy such as biofuels. Currently, Brazil is the largest producer of *Saccharum* sp. and in order to reduce negative impacts of its cultivation practice, the burning of culture before harvesting has been substituted for mechanized harvesting, leading to residue accumulation in the field. The slow decomposition of residue permits soil protection benefits associated with nutrient cycling and increasing of organic matter and microbial activity. Therefore, we evaluated the effect of two biological products based on *Trichoderma* sp. on decomposition of sugarcane residue, nutrient mineralization and soil attributes, including total organic carbon, microbial biomass and humic fractions. The study was organized in a 3x2x4 triple factorial design in three replications. The factors were: (1) inoculation of 2 biological products and control without inoculation; (2) with or without urea addition; and (3) four evaluation times (5, 15, 35 and 84 days). The experimental system consisted of trays containing 1100g of soil and 150g of residue, where litter bags containing 5g of sugarcane residue were added to evaluate the decomposition. The incubation time promoted the increase in the soil of microbial biomass, organic carbon, fulvic acid and the content of some nutrients (calcium, magnesium and potassium). On the other hand, nitrogen and phosphorus levels did not show significant variations. Furthermore, the addition of urea accelerated the rate of residue decomposition in the litter bags. The inoculation did not significantly affect the study. The fungi of biological products were not detected in the active community at the end of the experiment, suggesting the inoculants were replaced by native fungi from the residue. More research about the practice and dynamic of residue decomposition in field conditions is necessary, as it is expected to increase the generation of clean energy with adoption of sustainable management practices that contributes to nutrient cycling.

Keywords: residue; renewable energy, sugarcane

A decomposição dos resíduos de cana-de-açúcar melhora os atributos químicos e microbiológicos do solo

A decomposição da palhada é um processo que acontece nos sistemas agrícolas que cultivam cana-de-açúcar, desempenhando importante papel na proteção do solo contra a erosão, da sua estrutura física e na ciclagem de nutrientes. Com práticas agrícolas mais sustentáveis, a importância desse material orgânico tem crescido significativamente. Assim, este estudo investigou o impacto de produtos biológicos à base de *Trichoderma sp.* na decomposição da palhada de cana-de-açúcar, mineralização de nutrientes e saúde do solo, o que mostrou o aumento da biomassa microbiana, carbono orgânico e alguns nutrientes e uma substituição dos inoculantes por fungos provenientes da própria palhada.

Palavras- Chave: resíduo; renovável; cana-de-açúcar
