



II INTERNATIONAL WORKSHOP ON **SOIL BIODIVERSITY**

Centro de Ciências Agrárias, UFPI, Teresina - PI
15 a 17 de abril de 2024

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MANAGEMENT OF *Sorghum Sudanense* (Piper) Stapf. AND ITS EFFECTS ON THE BIOLOGICAL ATTRIBUTES OF THE SOIL IN A SOYBEAN CULTIVATION SYSTEM IN BRAZIL

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Sudan grass (*Sorghum sudanense* (Piper) Stapf.) as a cover crop in a soybean cultivation system represents a promising alternative to boost the sustainability of the agroecosystem in the Brazilian Northeast Cerrado. However, it is still necessary to investigate the ideal cutting time for this forage, focusing on soil quality, especially biological quality. This study proposes to determine the impact of sudan grass cutting times on soil biological quality indicators. The experiment was conducted between 2021 and 2022 at Fazenda Barbosa, Brejo, Maranhão, Brazil. A randomized block design was used with six sudangrass cutting times: 150, 120, 90, 60, 30 and seven days before soybean sowing (DBS), with four replications. At full maturation of soybeans, soil samples (0-0.10 m) were collected and total organic carbon (TOC) was determined; carbon (CMB) and nitrogen from microbial biomass (NMB); basal soil respiration (BSR); activity of dehydrogenase (DHA) and fluorescein diacetate (FDA) enzymes; metabolic quotient ($q\text{CO}_2$) and microbial quotient (q_{mic}). The data were subjected to analysis of variance. When a significant effect was verified by the F test ($p \leq 0.05$), regression analysis was applied by adjusting mathematical models ($p \leq 0.05$). Early cutting of sudan grass did not influence ($p > 0.05$) TOC, NMB, BSR, $q\text{CO}_2$ and enzyme activity. Cutting the grass at 150 days favored the increase in CMB (111 g kg^{-1}). Sudan grass cut later (seven DBS) reduced MBC and q_{mic} by 63% and 67%, respectively. Late cutting delays the decomposition of sudan grass, resulting in more recalcitrant and lower quality residue. These characteristics reduce soil microbial activity and efficiency. Early cutting (150 DBS) of sudangrass, as a cover crop in soybean cropping systems, promotes more efficient incorporation of carbon into microbial biomass in the Brazilian Northeast Cerrado.

Keywords: *Glycine max* L.; soil microbial activity; soil microbial biomass; Sudan grass.

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