EFFECT OF DIAZOTROPHIC PLANT GROWTH-PROMOTION BACTERIA ON SOIL MICROORGANISM ACTIVITIES

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ABSTRACT

The input of *N*-fertilizers used in the Brazilian sugarcane production systems are still low compared to other regions of the world, which have similar yields. However, the extensive cultivation area places the crop as the second largest demander of nitrogen fertilizers in the country, responsible for 22% of the country's *N*-fertilizers consumption. The use of diazotrophic plant growth-promotion bacteria (DPGPB) has emerged as a promising technique to attenuate that problem. The potential contribution of DPGPB on the biological fixation of N_2 was reported to be up 70% of total nitrogen incorporated by some sugarcane varieties. However, it is important to know how this management can affect the microorganism activities that are important in soil nutrient recycling. This work was carried out in order to compare the soil basal respiration (BR) and the total microbial activities using the fluorescein diacetate analysis (FDA), in an area cultivated with sugarcane (1st ratoon), which received nitrogen fertilizer or inoculant. The analysis were carried out eight months after the plant-cane was harvested. Although the evaluated areas had different amounts of straw kept on the soil, this factor did not affect the microbiological activities. It was found that BR and FDA were 21% and 19% higher in the inoculated treatment, respectively. This may be related to the higher amount of labile C (LC) in the soil resulting from the inoculation. This was demonstrated by the positive correlation between the two parameters and the LC. These results showed a positive effect of inoculation of sugarcane with DPGPB on soil microbial activities.

Keywords: basic respiration, microorganism activities, nitrogen fixation, sugarcane