

TITLE: BACTERIAL PRESENCE IN NATURAL ATTENUATION PROCESS ON SOIL WITH TEBUTHIURON AND VINASSE

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ABSTRACT: The ban on sugarcane crop burning in harvest promoted weeds increase and consequently greater herbicides use for their control. Thus, tebuthiuron stands out among the most commonly herbicides used. This compound exhibits moderate to extreme toxicity and high persistence, which may cause environmental impact. Furthermore, vinasse application in sugarcane plantation is an economically viable solution in fertigation. However, the low pH and high organic load in vinasse present a great pollutant potential. The purpose of this work was to evaluate the effect in microbial community of tebuthiuron doses associated or not to vinasse in soil cultivated with sugarcane. Experimental was based on completely randomized design in 3x4 factorial scheme, which was defined by recommended dose of tebuthiuron and by vinasse volume generally used for application in sugarcane crops. CFUs number for bacteria was determined using Pour Plate method for 12 soil samples in two distinct periods: initial time (ti) and final time (tf), after 88 days of biodegradation by natural attenuation. Plating was performed in triplicate using Plate Count Agar (PCA) culture medium with 1.0 mL inoculation of aqueous extract (solubilized). The incubation for each treatment was performed for 48 h at 35 °C. Results were analysed using variance analysis, simple correlation and contrasts at 5.0% of probability to means comparison. Overall, it was revealed a negative impact on bacterial community by tebuthiuron and/or vinasse addition when compared to control treatment. After the biodegradation period (tf), there was an increase in colonies for most treatments. Moreover, eight treatments had statistically different results between initial (ti) and final time (tf). This result in favoring bacterial community after biodegradation can be explained by several reasons. Firstly, negative effects on soil microbial biomass with herbicide application were demonstrated considering herbicide presence. However, studies have reported the reduction of herbicide persistence when vinasse is added to soil due to vinasse components, which increase microbial biomass activity. Therefore, it was observed the initial impact in bacterial community by the application of tebuthiuron and vinasse in soil cultivated with sugarcane and also a higher number of these microorganisms after 88 days of natural attenuation process.

Keywords: biodegradation, CFU, herbicide, sugarcane.

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