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# Soybean Growth Affected by the Application of Biodigestates from Sugar Cane Vinasse

Mariane Porto Muniz[1], Joachim Werner Zang[1], Warde Antonieta da Fonseca-Zang[1], Andrea Schüch[2], Bettina Eichler-Loebermann[2], Wilson Mozena Leandro[1]

[1] *Federal Institute of Goiás, Brazil*

[2] *University of Rostock, Fac. of Agricultural and Environmental Sciences, Germany*

**Abstract**

The biodigestion of vinasse, a byproduct of sugar cane ethanol industry, is a technology that results in the formation of two products: biogas and the biodigestate of vinasse. Besides the production of biogas that can be used as energy source (for electricity generation or heating), the resulting biodigestate presents a remarkable reduction in its biochemical oxygen demand (BOD), which in turn decreases the pollutant impact of the vinasse. Moreover, the fertiliser value of vinasse will not be reduced, keeping the same potassium levels and allowing the use of vinasse in irrigation systems. Sugar-cane is a semi-perennial crop, requiring replanting every five to seven years. In the Central region of Brazil, soybean is one of the best alternatives as crop rotation between two sugar cane production cycles because of the short production season and the contribution to the soil nitrogen pool. This work aimed to study the effect of application of different vinasse biodigestate amounts on the development of soybean plants.

The test was conduced in the Faculty of Agronomy of the Federal University of Goiás (Brazil). Pots were filled with a Rhodic Ferralsol and planted with soybean seeds. The treatments consisted of different amounts of biodigestate (equivalent to 0, 0.5, 1, 2 and 3 times the recommended amount, which is 300 $m^3$/ha). Vinasse was also applied at the recommended rate (300 $m^3$/ha). Plants height and diameter were measured after seven weeks of planting.

Except for the 150 $m^3$/ha treatment, all other treatments presented lower plant height and diameter when compared to the control treatment (no application of vinasse). One of the possible reasons is that the high content of K present in the biodigestate and the vinasse had a phytotoxic effect on the soybean plants. Further studies are being conduced to better understand the processes and impacts of application of sugar cane byproducts and avoid negative impacts.

**Keywords:** Bioenergy, *Glycine max*, natural resources management, probiogas, residues

**Contact Address:** Mariane Porto Muniz, Federal University of Goiás, Department of Agronomy, Rua: Vereador Vicente Francisco N°171, 75340-000 Hidrolândia, Brazil, e-mail: mportomuniz@gmail.com