

POTENTIAL OF SUGARCANE VINASSE TO USE AS AN ALTERNATIVE POTASSIUM SOURCE FOR BRINJAL (*Solanum melongena* L.) CULTIVATION

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Brinjal (*Solanum melongena* L.) is an important cash crop that responds well to potassium fertilizers. However, the cost of potassium fertilizers is often unaffordable for small-scale farmers. Sugarcane vinasse is a potassium-rich liquid waste generated in the ethanol industry. However, the high electrical conductivity (EC) content of vinasse poses a significant challenge to its use in agriculture. Therefore, a study was conducted to assess the potential of sugarcane vinasse as an alternative potassium source while mitigating its adverse impacts through biochar application. A pot experiment was conducted using brinjal as an indicator plant in a net house at the Faculty of Agriculture, Rajarata University of Sri Lanka. The treatments consisted of combinations of vinasse, Muriate of Potash (MOP), and biochar (0, 0.05 kg, 0.1 kg), along with nitrogen (N) and phosphorus (P) levels recommended by the Department of Agriculture. Control treatments had no vinasse with varying biochar levels, while treatments 4 to 12 included different percentages of vinasse (25%, 75%, 100%) and biochar (0, 0.05 kg, 0.1 kg). Treatments were arranged in a split-plot design within a completely randomized design, with three replicates. Soil and plant growth parameters were measured at two-week intervals and statistically analyzed using R software. According to the results, significantly higher ($p < 0.05$) soil potassium content was observed in treatments using MOP as a potassium source. However, no significant differences ($p < 0.05$) were observed in plant height, number of leaves, or plant potassium contents in treatments with vinasse compared to the control. A decreasing trend in soil EC was observed with increasing biochar application rates. Overall, it could be concluded that sugarcane vinasse has the potential to be used as a potassium source in agriculture, offering an alternative for the high-cost imported MOP.

Keywords: Biochar, Brinjal plant, Potassium fertilizer, Vinasse