**A Comparison of Sugarcane Bagasse Based Biochar and Boiler Ash on Soil Physicochemical Properties and Initial Growth of Sugarcane**

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Sugarcane is one of the crops which remove a higher amount of nutrients from the soil. However, its by-products have a wide use as soil amendments. As a by-product, boiler ash can enhance soil physical properties and thereby increase root development. However, soil chemical properties can adversely be affected. In contrast, the application of biochar is a proven technique to improve soil properties and limited information is available on the direct application of sugarcane boiler ash as a soil amendment. Therefore, this study was conducted as a pot experiment under a shade house conditions to compare the effect of biochar and boiler ash on soil physicochemical properties and the initial growth of the sugarcane variety of SL 96 128. Ten treatment combinations including 1t/ha, 2t/ha, 4t/ha and 6t/ha of biochar and boiler ash with the recommended chemical fertilizers and zero amendments as control treatments were arranged as randomized complete block designs with 4 replicates. After 3 months, soil physicochemical properties and plant growth performances were evaluated separately. The results revealed that the amended biochar and boiler ash had been facilitated to increase the plant nutrient availability. The variety SL 96 128 under different treatments was only significant with the zero amended level and other biochar and boiler ash amended levels were similarly performed. The highest amount of boiler ash application that 6t/ha showed a low pH buffering capacity of the soil. Results concluded that the application of boiler ash up to 6t/ha was not badly affected the sugarcane plants in this study for up to 3 months. The application of boiler ash should be practiced under well-monitored conditions and further studies are needed to identify the effect of boiler ash by conducting a filed level experiment for the complete cropping cycle of sugarcane.

**Keywords:** *boiler ash, soil amendment, sugarcane by-products*