

EFFECT OF BIOCHAR ON REDUCING SOIL SALINITY STRESS IN BRINJAL GROWN IN REDDISH BROWN EARTH SOIL

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Salinity stress is a significant abiotic constraint to crop production, globally. This study evaluated the efficacy of biochar in ameliorating salinity stress in Brinjal (*Solanum melongena* L.) grown in reddish-brown earth soil. The experiment was conducted in a net house at the Faculty of Agriculture, Rajarata University of Sri Lanka. Twelve treatments, replicated three times, were arranged in a split-plot within a CRD design. Treatments were fed with non-saline and saline water with three salinity levels as follows: T1: Control, T2: non-saline with 50 g biochar, T3: non-saline with 100 g biochar, T4: 1 dS m⁻¹ salinity with no biochar, T5: 1 dS m⁻¹ salinity with 50 g biochar, T6: 1 dS m⁻¹ salinity with 100g biochar, T7: 3 dS m⁻¹ salinity with no biochar, T8: 3 dS m⁻¹ salinity with 50 g biochar, T9: 3 dS m⁻¹ salinity with 100 g biochar, T10: 5 dS m⁻¹ salinity with no biochar, T11: 5 dS m⁻¹ salinity with 50 g biochar, and T12: 5 dS m⁻¹ salinity with 100 g biochar. Soil and growth parameters of brinjal were measured at two-week intervals. ANOVA analysis and LSD tests in R Studio revealed significant differences ($p<0.05$) in EC, available P, N, and exchangeable K among treatments. A decreasing trend in soil EC was observed with an increasing rate of biochar. There was no significant pH variation across treatments. Plant height increased with higher biochar levels. A decreasing trend in the number of leaves and biomass was observed with higher salinity levels. The study concludes that biochar reduces the adverse effects on brinjal caused by low-quality irrigation water, and higher biochar application rates improve soil resilience, mitigating salinity stress.

Keywords: Biochar, Brinjal, Reddish-brown earth soil, Salinity