GROWTH AND YIELD PERFORMANCE OF OKRA

(*Abelmoschus esculentus* L.) FERTILIZED WITH BIOCARBON

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ABSTRACT

A pot experiment was conducted to evaluate the effectiveness of biocarbon (biochar-based granulated organic fertilizer) on the growth and yield of okra (*Apelmosus esculentus* L.). The study also aims to suggest appropriate application rate of biocarbon-inorganic fertilizers combination for optimum growth of okra. The experiment was carried out at the Faculty of Technology, Eastern University, Sri Lanka, during the period of August to November 2025. The experimental design was a completely randomized design (CRD) with five treatments and ten replicates. Treatments are; T_1 (control) - recommended amount of inorganic fertilizer by the Department of Agriculture (RDOA), T_2 – 1/2 RDOA+12 tons/ha biocarbon, T_3 – 1/2 RDOA+15 tons/ha biocarbon, T_4 – 1/2 RDOA+18 tons/ha biocarbon, T_5 - 1/2 RDOA+ 21 tons/ha biocarbon. Biocarbon was applied at the time of basal fertilizer application. All other agronomic practices, except fertilizer application were followed based on DOA recommendation. Plant height, number of leaves and stem diameter were measured at two-week intervals. Fresh and dry weight per plant was measured at 8th weeks after planting. Number of pods per plant, pod length and width, diameter of pod, fresh and dry weight per pod, and total yield were measured at the time of harvesting. Analysis of variance was used to determine significant differences among treatments ($p<0.05$). The results revealed that treatments combining biocarbon with inorganic fertilizers (T_2 to T_5) significantly enhanced plant growth and yield compared to control (T_1). The highest growth and yield parameters were observed in T_4 (1/2 RDOA+18 tons/ha biocarbon), demonstrating the effectiveness of biocarbon in enhanced soil fertility by nutrient retention, nutrient uptake, and soil microbial activity. These findings suggest that the application of biocarbon with inorganic fertilizers can enhance okra productivity while reducing excessive use of inorganic fertilizer. The study also highlights the potential use of biocarbon in vegetable cultivation as a sustainable approach to improving crop growth and yield.

Keywords: Biochar, inorganic fertilizer, okra, growth, yield

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