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Combined Application of Rice-Straw Biochar and Poultry Manure Promotes Nutrient Uptake and Yield of Capsicum Frutescens

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Abstract : Field experiment was carried out during the cropping season of 2021 to examine the influence of the sole or combined application of rice-straw biochar and poultry manure on yield, nutrient uptake, and physiological attributes of Capsicum frutescens. The experiment was a randomized complete block design with five replicates. Treatments were 10 t/ha biochar (BC), 5 t/ha biochar + 5 t/ha poultry manure (BC+PM), 10 t/ha poultry manure (PM), and no amendment as the control (NA). Parameters determined were fruit yield, aboveground biomass, macro and micro nutrients in leaves, antinutrients content, and pigments (chlorophyll a, chlorophyll b, and carotenoids) concentration. Data were analysed with one-way analysis of variance, while means were separated using Duncan's Multiple Range Test at $p<0.05$. Soil amended with PM increased the nitrogen content of C. frutescens leaves by 40.9%, while polyphenol and phytic acid were reduced by 20.5% and 29.2%, respectively, compared with NA. Moreover, PM increased chlorophyll a and chlorophyll b by 91.9% and 16.4%, whereas proline was reduced by 31.3% compared with NA. However, PM and BC+PM had comparable influence on pigments, nutrients and antinutrients contents of C. frutescens. BC+PM significantly increased yield and aboveground biomass of C. frutescens by 52.9% and 99.2%, respectively, compared with NA. BC had no significant influence on the yield and nutrient uptake of C. frutescens compared with NA. In conclusion, sole application of poultry manure or combined with rice-straw biochar increased yield and nutrients availability in the leaves of C. frutescens.

Keywords : capsicum frutescens, biochar, nutrient uptake, poultry manure, organic amendment
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