

Coapplication of chicken litter biochar and urea only to improve nutrients use efficiency and yield of oryza sativa L. cultivation on a tropical acid soil

ABSTRACT

The excessive use of nitrogen (N) fertilizers in sustaining high rice yields due to N dynamics in tropical acid soils not only is economically unsustainable but also causes environmental pollution. The objective of this study was to coapply biochar and urea to improve soil chemical properties and productivity of rice. Biochar (5 t ha^{-1}) and different rates of urea (100%, 75%, 50%, 25%, and 0% of recommended N application) were evaluated in both pot and field trials. Selected soil chemical properties, rice plants growth variables, nutrient use efficiency, and yield were determined using standard procedures. Coapplication of biochar with 100% and 75% urea recommendation rates significantly increased nutrients availability (especially P and K) and their use efficiency in both pot and field trials. These treatments also significantly increased rice growth variables and grain yield. Coapplication of biochar and urea application at 75% of the recommended rate can be used to improve soil chemical properties and productivity and reduce urea use by 25%.

Keyword: Fertilizers; Biochar; Urea; Nutrients; *Oryza sativa* L.; Tropical acid soil