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Response of corn to chicken dung and rice hull ash application and mycorrhizal fungi inoculation

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ABSTRACT

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This study evaluated the growth and yield responses of corn to chicken dung and rice hull ash application as well as to mycorrhizal fungi inoculation. The experiment was laid out in a split-plot in Randomized Complete Block Design consisting of three replications. Vesicular-arbuscular mycorrhizal (VAM) inoculation served as the main plot while application of fertilizer was designated as the sub-plot. The fertilizer treatments included the following: T_0- control, T_1- inorganic fertilizer (60-60-60 kg ha^{-1} N, P_2O_5, K_2O), T_2- chicken dung alone (60 kg ha^{-1}N) and T^3- chicken dung (as in T_2) + 30 kg ha^{-1} rice hull ash. The experimental area had an alluvial clay loam soil.

Results showed that VAM inoculation significantly increased the total N but not the total P, K, and Ca contents of the tissue of corn plant. However, VAM inoculation did not significanlty affect the grain yield and the agronomic characteristics of corn. In contrast, fertilization using either inorganic fertilizer, chicken dung or chicken dung plus rice hull ash enhanced the early tasseling and silking but not emergence and maturity of corn. The application of fertilizers significantly increased plant height as well as the fresh stover yield compared to the control.

The inorganic fertilizer, chicken dung, and chicken dung plus ricehull ash, significantly increased the number of ears per plant, ear length, number of grains per ear, weight of 1000 seeds, grain yield and harvest index. The use of chicken dung combined with rice hull ash for corn production is a good substitute for the inorganic fertilizer in increasing grain yield.

Keywords: chicken dung, rice hull ash, corn, nutrient uptake, mycorrhizae

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