

Compost and crude humic substances produced from selected wastes and their effects on *Zea mays* L. nutrient uptake and growth

ABSTRACT

Production of agriculture and timber commodities leads generation of enormous quantity of wastes. Improper disposal of these agroindustrial wastes pollutes the environment. This problem could be reduced by adding value to them. Therefore, a study was carried out to analyse and compare the nutrients content of RS, RH, SD, and EFB of composts and crude humic substances; furthermore, their effect on growth, dry matter production, and nutrient uptake for *Zea mays* L., and selected soil chemical properties were evaluated. Standard procedures were used to analyze humic acids (HA), crude fulvic acids (CFA), crude humin (CH), soil, dry matter production and nutrient uptake. Sawdust and RS compost matured at 42 and 47 days, respectively, while RH and EFB composts were less matured at 49th day of composting. Rice straw compost had higher ash, N, P, CEC, HA, K, and Fe contents with lower organic matter, total organic carbon, and C/N and C/P ratios. The HA of sawdust compost showed higher carbon, carboxylic, K, and Ca contents compared to those of RS, RH, and EFB. Crude FA of RS compost showed highest pH, total K, Ca, Mg, and Na contents. Crude humin from RS compost had higher contents of ash, N, P, and CEC. Rice straw was superior in compost, CFA, and CH, while sawdust compost was superior in HA. Application of sawdust compost significantly increased maize plants' diameter, height, dry matter production, N, P, and cations uptake. It also reduced N, P, and K based chemical fertilizer use by 90%. Application of CH and the composts evaluated in this study could be used as an alternative for chemical fertilizers in maize cultivation.

Keyword: Wastes management; Humic substances; Compost; Fertilizers