

Effect of amending urea with humic acids and acid sulphate on biomass production of Masmadu (*Zea mays* L.) and selected soil chemical properties.

ABSTRACT

Excessive use of fertilizers especially nitrogenous fertilizers with low management in relation to food safety and environmental pollution has in recent times become a subject of concern. This greenhouse study compared the effect of three different urea-humic acid-acid sulphate soil mixtures on maize biomass production, soil pH, ammonium and nitrate contents, and urea use efficiency compared with urea-N without additives (urea alone). Humic acid (HA), acid sulfate soil and soil used in the greenhouse study were analyzed for selected soil physio-chemical properties. The fertilizer mixtures and ammonia loss determination were carried out using standard methods. The treatments were evaluated in a completely randomized block design with 3 replications. The data obtained at the end of the study on biomass production, soil pH, exchangeable ammonium and available nitrate were analyzed using analysis of variance and the means were compared using Duncan's test using statistical analysis system (SAS) version 9.2. The soil used to test treatments was a sandy clay loam Typic Tualemkuts (Nyalau Series). Urea amended with different levels of HA alone significantly improved soil exchangeable ammonium compared to urea alone. All the mixtures significantly improved soil pH compared with urea alone. However, all the mixtures did not significantly affect biomass production and content of available nitrate compared with urea alone. Amending urea with HA and acid sulphate soil did not significantly affect biomass production of Masmadu (test crop) but it significantly improved soil pH and retention of exchangeable ammonium.

Keyword: Humic acid; Acid sulphate soil; Urea; ammonium; Nitrate; *Zea mays*; Biomass production.