

## Efficiency of coated urea on nutrient uptake and maize production

### ABSTRACT

A field experiment was conducted to study the effects of coated urea with urease inhibitor [copper (Cu) and zinc (Zn)], nitrification inhibitor (DMPP), biochar and geopolymer on ammonium, nitrate, Cu, Zn content and crop yield of maize. The treatments were composed of urea alone (control), urea coated Cu and Zn (UCuZn), urea coated with Cu, Zn, and DMPP (UCuZnDMPP), urea impregnated with biochar (Ubio) and urea coated with geopolymer (Ug2). Data showed that treatments with Cu, Zn, and DMPP produced lower ammonium ( $\text{NH}_4$ ) and nitrate ( $\text{NO}_3$ ) in UCuZn and UCuZnDMPP while they had the highest concentration of Cu and Zn in soil and plant tissues. Plots treated with UCuZn and UCuZnDMPP produced maximum N concentrations in grains and yield, with increases by 79.5% and 74.1%, respectively, as compared with urea (control). This finding demonstrates that by slow down the hydrolysis and nitrification process using urease and nitrification inhibitor were beneficial to increased N uptake, ultimately produced higher yield.

**Keyword:** Biochar; Copper; DMPP; Field; Geopolymer; Yield; Zinc