

Evaluation of coated urea for ammonia volatilization loss, nitrogen mineralization and microsite pH in selected soil series.

ABSTRACT

The increase in microsite soil pH due to surface application of urea to the soil is an important reason of ammonia volatilization loss and fast hydrolysis process. The use of Cu and Zn with biodegradable materials coatings were assumed to reduce ammonia volatilization losses by reducing soil pH and slowing down hydrolysis process. The present study was conducted to evaluate the effects of coated urea with the combination coatings of Cu, Zn, palm stearin, agar and gelatine on microsite pH. For this purpose, six urea treatments named; uncoated urea or control, Cu and palm stearin coated urea, Cu and agar coated urea, Cu and gelatine coated urea, Cu coated urea, Cu and Zn coated urea were prepared and evaluated for their effects on microsite pH, ammonia volatilization loss and mineralization of N in three tropical soil. For the each soil; soil properties, soil microsite pH, ammonia volatilization loss and N mineralization were determined with slandered methods. The results reveal that the microsite pH in the three soils varied significantly due to the variability in texture. The pH of microsite treated with coated urea was lower than the uncoated urea treatments in each soil. The reduction in the microsite soil pH was associated with urea hydrolysis. The rate of mineralization (30%) and ammonia volatilization (50%) reduced in the soils where the pH was low or stable on the fertilizer microsite after adding the fertilizer treatments. The results of this study proved the positive effectiveness of coating material and potential to control fast hydrolysis process and ammonia volatilization losses.

Keyword: Ammonia volatilization; Microsite pH; Nitrogen; Urease inhibitors.