

Consequences of Cu and Zn coated urea to minimize ammonia volatilization

ABSTRACT

Nitrogen (N) losses from agricultural fields are commonly observed particularly from urea. The rate of urea hydrolysis is accelerated as it remains in conventional form and about 70% of applied urea losses in different forms to atmosphere. Ammonia volatilization is persuasive loss among all the losses from urea. Therefore to minimize ammonia (NH₃) volatilization the micronutrient coated urea is applied to enhance N-efficiency and its uptake. This study is an application of micronutrient coated urea with zinc (Zn) and copper (Cu) for two soil series of Malaysia. A laboratory experiment was designed according to the force draft technique for trapping the NH₃ loss. The results have manifested that the rate of ammonia volatilization was 16% from uncoated urea and 8% from coated urea with micronutrients during the first two weeks of observations. After the six weeks of observations it was perceived that the ammonia losses for both soil series were gradually decreased with time. The mean comparison by using Tukey's range test has shown the positive effect of micronutrient coated urea in comparison with the conventional urea. However the urea coated with the combination of both micronutrients Cu and Zn has shown significant difference in contrast to the coating urea with single micronutrient. The overall results revealed the efficacy of micronutrient coated urea on both of the soil series to maximize N-uptake and reduce NH₃ volatilization.

Keyword: Micronutrients coated urea; Ammonia loss; N-uptake; Soil