

Ammonia volatilization from urea at different levels of zeolite.

ABSTRACT

Ammonia (NH_3) loss due to hydrolysis of urea can be substantial. When applied to the soil, up to 50% NH_3 volatilizes. This decreases urea-N use efficiency. The objective of this study was to minimize ammonia loss from urea using different levels of clinoptilolite zeolite. Six treatments were evaluated; (1) soil alone, (2) 2.60 g granular urea, (3) 2.60 g liquid urea, (4) 2.60 g liquid urea + 4 g of zeolite, (5) 2.60 g liquid urea + 8 g of zeolite and (6) 2.60 g liquid urea + 12 g of zeolite. The incubation study was conducted using close-dynamic air flow system method to measure the amount of NH_3 released. At the end of this study, soils samples were analyzed for pH, exchangeable ammonium (NH_4^+) and available nitrate (NO_3^-) using standard procedures. When urea was applied in liquid form, NH_3 loss was reduced when compared with granular urea, but not significantly different among the treatments with and without zeolite inclusion. Increase in soil pH was observed upon addition of higher amount of zeolite when compared with urea alone. High NH_4^+ content and low NH_3 loss for T5 directly showed that high cation exchange capacity (CEC) of the amended soil due to inclusion of zeolite was responsible for retention of more NH_4^+ in the soil even though the soil pH was higher when compared with T1 and T2. Liquid urea mixed with zeolite reduced NH_3 loss and increased NH_4^+ retention in the soil.

Keyword: Ammonia volatilization; Granular urea; Liquid urea; Zeolite.