

Ammonium and potassium exchange in acid tropical soil

ABSTRACT

High precipitation and low soil cation exchange capacity (CEC) of highly weathered acidic tropical soils require large amounts and many rounds of fertilization to increase the potential of these soils from leaching losses of soil ammonium (NH_4^+) and potassium (K^+). This study was conducted to evaluate the exchange properties of natural and synthetic zeolites on soil NH_4^+ and K^+ . A Bungor Series soil (Typic Paluedults) was taken from a depth of 0 to 5 cm for this leaching experiment. Each soil treatment was added either with equal amounts of NH_4^+ or K^+ and treated with and without zeolites. The treated soil was then leached with deionised water for 20 days and the soil leachate was collected at 5-day interval, to analyze for NH_4^+ and K^+ concentration. The results of this study showed that all types of zeolites were able to reduce substantial leaching losses of soil NH_4^+ and K^+ . The natural zeolites were better than the synthetic zeolites in retaining these cations. The study has demonstrated that zeolites could be used as an effective soil amendment to reduce leaching losses of soil NH_4^+ and K^+ in acid tropical soils with low CEC.

Keyword: Zeolites; Clinoptilolite; Acid soil; Ammonium; Potassium