

Effect of ground basalt on chemical properties of an ultisol and oxisol in Malaysia

ABSTRACT

Highly weathered soils in Malaysia need to be amended to rejuvenate their chemical fertility. In particular, soil pH should be increased sufficiently, while exchangeable Al eliminated in order to make them productive. A glasshouse study was conducted in Malaysia to determine changes in the chemical properties of Ultisol and Oxisol (highly weathered, infertile soils) treated with ground basalt under moist condition. The results showed that soil pH increased and exchangeable Al decreased significantly due to basalt application within 6 months, whereas the value registered was determined by the rate of application. At the application of 10 t basalt/ha, it was observed that available P and exchangeable K, Ca, and Mg were increased to the level sufficient for crop growth. Meanwhile, chemical reactions (increase in pH and decrease in p_{Ho}) in the soils had resulted in an increase of the cation exchange capacity (CEC). This means that the soils are now able to reduce the loss of basic cations via leaching under high rainfall. Thus, basalt is a good soil ameliorant with the efficacy comparable to that of limestone, which is commonly applied to eliminate acid soil infertility in the tropics.

Keyword: Basalt; Cation exchange capacity; Ultisol; Oxisol