Reactions of limestone and gypsum in soils under tropical environment

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Abstrak (Abstract)

Being exposed to tropical environment, Malaysian soils are mostly weathered. These soils are infertile due to low pH, high Al and deficient in Ca and/or Mg in the subsoil. Maize and groundnut do not produce high yield unless the soils are treated with appropriate amendments. Limestone and gypsum available in large quantities in the country are often used to ameliorate the soils. This paper describes chemical reactions in Malaysian soils affected by limestone and gypsum.

Limestone application ameliorates the topsoil where soil pH goes up, followed by lowering of Al. The Ca and Mg from the lime accumulate in that zone. These Ca and Mg are held by the increased negative charge when the soil pH is raised. Hence, the subsoil is unable to benefit from this agronomic practice. The change in soil pH due to gypsum application is small. Some Ca from gypsum move into the subsoil. In the soils containing high Al there is a slight drop in pH. On the contrary, pH of soils with high oxides content increases slightly. There is also an increase in negative charge of these soils. The increase in pH and negative charge is due to replacement of OH^- by SO_4^{2-}. The chemical reactions mentioned have important management implication for sustainable crop production.

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 25, No. 4, July-August 1999