Changes in chemical properties of an Ultisol as affected by palm oil mill effluent application

ABSTRACT

An experiment was conducted to determine the effects of palm oil mill effluent (POME) application on soil chemical properties. The POME was incorporated into the top 0-30 cm of Batang Merbau soil, an Ultisol. POME was applied at 0, 5, 10, 20, and 40 t ha-1, both in the presence and absence of 2 t ground magnesian limestone (GML). A succeeding crops of maize and groundnut were planted. The results of the experiment showed that POME application up to the rate of 40 t ha-1 did not significantly change the topsoil pH and exchangeable calcium (Ca), magnesium (Mg), and aluminum (Al). The addition of POME improved the soil fertility, which resulted in an increase of maize yield. The Ca and Mg from the POME accumulated in the topsoil, being held by the negative charge present on the exchange complex. The beneficial effects of POME and/or GML application lasted for about 3 years. The study indicated that application of POME together with GML is a good agronomic option to alleviate soil acidity in Ultisol for maize production.

Keyword: Palm oil mill effluent; Chemical property; Soil acidity; Ultisol