

Influence of organic and inorganic soil amendments on corn root growth and soil chemical properties

ABSTRACT

One of the main constraints to corn production on a highly weathered acid soil is aluminum (Al) toxicity. High Al concentration in acid soils restricts root growth by inhibiting cell elongation and cell division. The objective of this study was to determine the effects of inorganic and organic soil amendments on corn root growth and soil chemical properties. A laboratory experiment was conducted using Bungor series soil (Typic Paleudult) surface sampled (0 - 20 cm) from Puchong farm. Aliquot of the soil (600 g) was treated with legume residues (1% w/w), chicken manure (1% w/w), GML (4 t ha⁻¹), gypsum (4 t ha⁻¹) and control. The treated soils were moistened at field capacity (0.25 kg H₂O kg⁻¹ soil) and allowed to react for 7 days. Corn seeds (*Zea mays* L.) were sown and after 5 days root length was measured. The results showed that soils amended with GML or chicken manure gave relatively high root length compared to other treatments. The GML and chicken manure treatments increased soil pH and decreased both the soil exchangeable Al and Al-saturation. Chicken manure had an additional ameliorative effect over lime in that it increased soil exchangeable Ca, Mg and K.

Keyword: Aluminium; Lime; Chicken manure; Acid soils; Corn; Amendments