Scientific registration n° : 1401
Symposium n° : 40
Presentation : poster

Use of lime and gypsum to alleviate infertility in an Arenic Acrisol of Northeast Thailand
Utilisation de la chaux et du gypse pour améliorer la fertilité d'un sol ferrallitique sableux de Thaï lande

KANCHANAKOOL Nualsri[1], POSS Roland[2], BRUNET Didier[2], BHUTHORNDHARAJ Suwannee[1], SUVANNANG Nopmanee[1]

1 Department of Land Development, Phaholyothin Rd, Bangkok 10900, Thailand
2 Orstom, Department RED, UR 4, Phaholyothin Rd, Bangkok 10900, Thailand

The objective was to test the effectiveness of lime and gypsum application to alleviate acid soil infertility at Korat (15°N, 102°E, 1020†mm annual rainfall). The soil (Korat series) is characterised by 5% clay, 0.22% C, 4.0 pH_{CaCl2}, 0.94 cmolc kg^{-1} ECEC, 4 mg kg^{-1} P Bray2 and 22% aluminium saturation. The experiment was a factorial randomised block design with two factors, lime (650 kg ha^{-1} as $Ca[OH]_2$) and gypsum (1500 kg ha^{-1}). This paper reports on the first year of the experiment when a rotation of mungbean/sweet corn was studied. The same high N, P, K, S and Mg fertilisation was applied to all plots. Soil samples were taken before the experiment started, then 4 months and 9 months after amendment application. Soil suction was determined using tensiometers and the rooting system of corn was described using a grid.
Lime and gypsum had no significant effect on plant yield. Lime increased pH_{CaCl2} by 0.9 units in the topsoil (0-20 cm), but did not change any chemical properties in the subsoil. After 9 months lime had increased exchangeable Ca by 68% in the topsoil without changing exchangeable Mg and K. Gypsum did not increase soil pH significantly. Gypsum decreased aluminium saturation in the topsoil to 11% (-40%) after 4 months but had no further effect after 9 months. After 9 months, gypsum had decreased exchangeable Mg to 0.07 cmolc kg^{-1} (-30%) in the 0-40 cm layer without changing the other chemical properties. Neither lime nor gypsum increased root density or soil suction.
Lime had no effect on yield the first year, but may have an effect in the following years through its long-lasting effect on pH and exchangeable Ca. The only beneficial effect of gypsum was to decrease aluminium saturation in the topsoil for a few months. Any effect of gypsum disappeared nine months after application, except for a strong decrease in exchangeable Mg. Thus in this Arenic Acrisol, gypsum is not beneficial to crop production.

Keywords: mungbean, sweet corn, aluminium saturation, exchangeable Mg

Mots clés : maïs doux, saturation aluminique, magnésium échangeable