No. 28

Cover crop and fertilization effects on nutrient dynamics in fruit tree cropping in the central Amazon

Mota, Maria do Socorro [1]; Lehmann, Johannes [2] and Schroth, Götz [3]

[1] Embrapa Amazonia Ocidental, Amazonas, Brazil, [2] University of Bayreuth, Federal Research Institute for Forestry, Germany, [3] University of Hamburg, Germany

This study was carried out on a Xanthic Ferrasol northeast of Manaus, Amazonas, Brazil. The main objective was to study the effect of fertilization on soil acidity and pH dynamics in a mixed tree cropping system with brazil nut (*Bertholletia excelsa*), cupuaçu (*Theobroma grandiflorum*), peach palm (*Bactris gasipaes*), annatto (*Bixa orellana*) and pueraria (*Pueraria phaseoloides*). Fertilizer at four different levels (30%, 100%, 100%+P and 30%-N-lime, of the recommended fertilization, Embrapa Manaus) was applied in December 97. The soil samples were taken from 0-5, 5-10, 10-15, 15-20 and 20-40 cm depths in October 97, January, March and May 98. Acidity was determined through agitation and titration with NaOH. Soil pH was measured in an aqueous matrix.

Fertilization at a level of 30%-N-lime produced highest acidity compared to the other levels of fertilization. The effect of fertilization on soil acidity was restricted to a depth of 0-5 cm. In other depths, the acidity was highest with 30% e 30%-N-lime. Pueraria and annatto presented the highest acidity at all depths. The highest acidity was observed in January, probably caused by the transformation of NO^{2-} to NO^{3-} which occurs after fertilization of ammonium sulfate and subsequent nitrification. From January to May, acidity decreased at 0-5 and 5-10 cm depths, although it remained constant at other depths. The effect of soil pH was opposite to acidity, highest for cupuaçu and peach palm and lowest for annatto at all depths.