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Inventory of Soil Acidity Status in Crop Lands of Central and Western Ethiopia

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Abstract

An inventory of the current soil acidity status in western and central Ethiopian nitosols was carried out in May 2006. A total of one hundred twenty five soil samples from 0–20 cm surface layer in crop lands were collected from five districts (Mana Sib, Nejo, Jarso, Bojji, and Ghimbi), three districts (Digga, Leqa Dullacha, and Guto Gidda) and two districts (Bako Tibe and Chaliya) of west Wellega, east Wellega and west Shoa zones, respectively. Soil pH (H₂O, 1M KCl) was measured in 1:2.5 soil solution ratios, exchangeable acidity was measured by titration and exchangeable bases were determined from the leachate of 1M ammonium acetate at pH 7. All samples collected from the three study zones were acidic and the degree of soil acidity varies among study zones, districts and peasant associations. The acid saturation percentage (ASP) in the three study zones was highly variable ranging from low to extremely high. In majority of samples from districts of west Wellega zone and Guto Gidda district of east Wellega zone, the ASP was quite high (>60). At Bako Tibe and Chaliya districts of west Shoa zone, the exchangeable acidity is low ranging from 0 to 1 cmol (+) kg⁻¹. In moving from central (west Shoa) to western Ethiopia (west Wellega), the degree of soil acidity that is measured in terms of ASP is increased. In west and east Wellega zones the large proportion exchangeable acidity was due to exchangeable aluminum while at west Shoa zone it was due to exchangeable hydrogen. The acidity problem in east and west Wellega zones of Ethiopia is critical and calls for immediate intervention to amend the soil for crop production.

Keywords: Acid saturation percentages, crop land, exchangeable acidity and aluminum, pH