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Effects of traditional practice of soil burning (guie) on soil chemical properties at Sheno areas of North Shoa, Oromia region, Ethiopia

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The study was conducted at the Kimbibit District, which is located in the North Shoa Zone of Oromia National Regional State, with the objective of investigating the effects of traditional practice of soil burning (guie) on soil chemical properties of soils of the study area. Disturbed soil samples were collected from farmers burned fields and normal fields in three peasant associations. The burned soils samples were collected from the bottom, middle and top of the heap. Soil parameters were analyzed using standard procedures and the results were subjected to analysis of variance (ANOVA). Mean separation was done using the Least Significant Difference (LSD). Except percentage base saturation and available Cu, all the other parameters considered in this study were significantly affected by soil burning. The burning reduced organic carbon (73.7, 85.3 and 75.1%), total N (52.6, 68.4 and 26.3%), CEC (30.8, 44.8 and 37.2%), exchangeable Na (0.9, 14.2 and 13.3%), exchangeable Ca (27.9, 49.6 and 35.3%), exchangeable Mg (16.7, 26.7 and 20.0%) and available Fe (13.4, 26.2 and 35.3%) on the bottom, middle and top of the heap, respectively. Burning increased the soil pH (5.6, 15.2 and 8.1%), available phosphorous (955.6, 1219.4 and 986.1%), exchangeable K (165.7, 328.6 and 165.7%), available Zinc (239.4, 284.8 and 219.6%) and Mn (6.5, 13.3 and 9.0%) on the bottom, middle and top of the heap, respectively. The soil attributes due to soil burning showed an overall change towards the direction of the loss of its chemical fertility compared to unburned soils.

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