Impact of Fertilizers on Heavy Metal Loads in Surface Soils in Nzoia Nucleus Estate Sugarcane Farms in Western Kenya. (2010).

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ABSTRACT

Analysis of heavy metals in top soil samples from Nzoia sugarcane farms in Western Kenya found elevated levels of heavy metals in the soils with mean concentrations (mg kg^{-1} dry weight) of 142.38, 59.12, 73.35, 116.27, 409.84 (dry season) and 144.22, 50.29, 72.14, 158.81, 368.83 (wet season) for Cr, Pb, Cu, Zn and Fe, respectively, compared with a control soil sample from an adjacent field where fertilizers are not applied having mean concentrations of 117.27, 61.87, 63.68, 123.49, 282.93 (dry season) 108.00, 50.68, 66.10, 114.23, 167.01 (wet season), respectively. The heavy metal loads in the sugarcane farms were above international standards. The levels of the same metals in the fertilizers used in the sugarcane farms were within acceptable international standards. A risk assessment of the continued use of phosphate fertilizer (DAP) in the farms based on a 50-year period, did not exceed international threshold. The soil pH values (6.18 dry season and 5.66 wet season) were low compared to the control (7.46 dry season and 7.10 wet season) a situation that could accelerate heavy metal solubility and mobility in the farm soil. Lowering of soil pH was attributed mainly to fertilizer application and partly to increased organic matter content as shown by the high mean total organic carbon content values of 8.63% (dry season) and 8.43 (wet season) in comparison with a control soil meant total organic carbon content value of 4.76% (dry season) and 5.02 (wet season).

Bull Environ Contam Toxicol pp.1-7. (2010).