

SHORT-TERM APPRAISAL OF HEAVY METAL CONTENTS IN COMMERCIAL INORGANIC FERTILIZERS BLENDED AND MARKETED IN NIGERIA

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ABSTRACT

Human food chain toxicity has been shown to be influenced by application of inorganic fertilizers. This research was conducted to appraise heavy metal contents of three (3) commercial NPK fertilizers blended and marketed in Nigeria in a short-term experiment. The different NPK fertilizers analysed were N₁₅P₁₅K₁₅, N₂₀P₁₀K₁₀ and N₂₇P₁₃K₁₃ using Atomic Absorption Spectrophotometer (AAS). Three batches of each of these samples were analysed in 2008, 2011, and 2014. In 2008, the results showed varied concentrations of toxic non-nutritious metals (Cd and Pd) and trace elements (Fe, Zn, Mn, Co, Cu, Mo, Ni and Cr) while V, As, Hg and Ag were below detection level. The heavy metal assessment in 2011 showed significant reduction ($p > 0.05$) in some toxic metals and trace elements. Follow-up evaluation in 2013 showed further significant reduction ($p > 0.05$) in addition to V, As, Hg and Ag that were below detection level. Only Pb was indicated as toxic non-nutritious metal with values (mg/kg) of 0.20 ± 0.01 , 0.27 ± 0.08 and 0.12 ± 0.01 in N₁₅P₁₅K₁₅, N₂₀P₁₀K₁₀ and N₂₇P₁₃K₁₃ fertilizers respectively. Though the concentrations of these heavy metals were within the recommended levels, however a slight increase could be expected from other possible inputs especially in mining areas. This should raise the need to monitor changes that could occur in soils in view of their health implications.

Keywords: Human food chain, inorganic fertilizers and heavy metal toxicity.