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## **Analysis of selected, commercially available inorganic fertilizers and soil NPK content in Puhudivula; Medawachchiya**

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The increased prevalence of CKDu confined to specific geographical regions and among specific occupational groups of Sri Lanka has drawn the attention of scientific community in recent years. This study was conducted to investigate possible contributions of inorganic fertilizer usage on the disease prevalence at Puhudivula; Medawachchiya. Five commercially available fertilizer samples (Urea, TSP, MOP, TOP and Chili mix) most commonly used in the study area were analyzed for their NPK content and trace metal amounts. The NPK composition, calcium content and physiological properties of soil were also analyzed in five selected sites. The total nitrogen amounts were determined using standard Kjeldahl procedure. Total phosphate content of fertilizers was analyzed using ammonium vanadomolybdate method while both total phosphate and inorganic phosphate amounts in soil were determined using molybdenum blue method. The potassium and calcium amounts were determined using flame photometry. The percentage NPK compositions of the analyzed fertilizer samples agree with the percentage compositions listed by the manufacturers for each fertilizer. However, less total nitrogen and less phosphate percentages were measured in Urea and TSP respectively. The NPK composition of soil followed  $N\% > K\% > P\%$  order with overall mean concentration of NPK between 279.4-1537.3 mg/kg, 32.4-193.7 mg/kg and 3.0-25.5 mg/kg respectively. The mean calcium concentration in soil was high, ranged from 537.27-1007.75 mg/kg. The trace metals Cd, Pb, Cr, Zn, Cu and Fe in fertilizer samples were analyzed using Atomic Absorption Spectrometer. From the analyzed trace metals, Fe exhibited a remarkable presence in all analyzed fertilizers except Urea with an overall mean concentration  $>1550.0$  mg/kg and the mean concentrations of Cd, Pb and Cr followed the phosphate percentage by weight. Cd and Pb mean concentrations ranged from 0.23-1.80 mg/kg and 0.94-7.17 mg/kg respectively and were below the WHO maximum acceptable concentrations. According to the results, the addition of fertilizers did not increase the heavy metal levels in soil significantly unless it accumulates, and the excessive use of inorganic fertilizers mainly the ammonium-based fertilizers in already nitrogen enriched soils indicates to be causing the acidification of soils and it is evident that it may be mobilizing the calcium ions from its immobile form. This study provides new data to relevant authorities to limit the excessive annual fertilizer input on these lands through proper NPK analysis prior to application.

**Keywords:** CKDu, inorganic fertilizer, metals, NPK, soil

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