

## **Physicochemical, Geochemical and Mineralogical Aspects of Agricultural Soils in Limpopo Province, South Africa**

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**ABSTRACT** Soil samples were collected from three selected sites (uncultivated, cultivated and grazing land) at University of Limpopo Experimental Farm (Syferkuil) in Mankweng area to characterise their physicochemical, geochemical and mineralogical properties and their influence on soil fertility for agriculture. Soil textural triangle using Texture Auto Lookup Software (TAL 4.2) Package was used to determine particle sizes of samples which were all dominated by a loamy texture. Chemical characterisation carried out included determination of exchangeable cations, major elemental oxides and trace elements. Silica was the dominant oxide with the highest weight percentage values ranging from 75.99 to 83.45. Chemical index of alteration values of 66 to 75 depicted moderate silica weathering with depletion of soil nutrients due to leaching. Seven minerals were identified in soil samples which were dominated by kaolinite. The presence of mica and smectites in the soils displayed properties typical of soils rich in exchangeable cations compared to those with mineral assemblage dominated by kaolinite and quartz. The overall findings indicated moderate concentrations of nutrient elements and favorable plant growing conditions, where addition of adequate nutrient fertilizers would potentially optimize crop yield.