

APPLICATION OF CANONICAL DISCRIMINANT ANALYSIS TO SOIL CLASSIFICATION

BY

D. O. Asawalam and F. Ekeleme

College of Crop and Soil Sciences

Michael Okpara University of Agriculture, Umudike

PMB 7267, Umuahia, Abia State, Nigeria.

asawaldo@yahoo.com

ABSTRACT

Soil classification is traditionally based on soil morphological, physical, chemical, and mineralogical properties. Morphological properties of soils like colour, texture, structure, consistence, as well as mineralogical analysis data have their results presented as ratings that are character variables. However, most physical and chemical properties are determined in the laboratory and results given as numeric variables. Very frequently, different pedologists classifying the same soil may come out with different results at categories below the Order level of classification. Our objective was to develop a statistical approach to soil classification using Canonical Discriminant Analysis.

In this study, we applied the statistical tool of Canonical Discriminant Analysis to numerical values of soil chemical properties obtained from the data base of Federal Department of Agricultural Land Resources for southeastern Nigeria. Results obtained were compared with conventional soil classification based on Soil Taxonomy. There was reasonably good agreement between the results of the two approaches which indicates good prospect for the application of statistical tools to soil classification. Based on the results obtained, it is recommended that further works be carried out to develop and standardize this statistical approach for soil classification.