## Contaminants leaching from fresh poultry paste: a lysimeter study on sandy soils under tropical conditions

## ABSTRACT

A lysimeter study was conducted on sandy soil of Minna, North central Nigeria to assess the migration of nitrates, phosphates, bacteriological parameters and heavy metals contents of poultry manure through Minna soil. This is with a view to examining the environmental effect of indiscriminate land application of excessive poultry manure on shallow groundwater quality. A lysimeter and rainfall simulator assembly was installed on an undisturbed 0.9m diameter, 3m depth soil core after which 50kg of characterized poultry manure was applied at the top. Rainfall of 125mm was simulated and water samples were collected at different depths of the soil core through the lysimeter and were taken to laboratory for analysis. Results showed that nitrate and phosphate in poultry manure were able to leach to a depth of 2.5m of the soil core four months after poultry manure application while turbidity and electrical conductivity reached their maximum value at depth 2.5m after three months. Faecal coliform, total coliform and faecal streptococci were detected at depth 2.5m also two months after the application. Statistical analysis using New Duncan Multiple Range test showed significant variation (p<0.05) of all the parameters tested with depth of sample collection and months after application of poultry manure. Spearman's correlation coefficient established both positive and negative correlation between the parameters studied in this research. Heavy metals tested, Arsenic, copper, zinc, chromium and manganese were not able to leach beyond 0.5m depth of the soil core throughout the experimental period.

Keyword: Aquifer vulnerability; Lysimeter; Poultry manure; Heavy metals