Mayowa Francis Adelekun

Thesis title:
Measurement and simulation of greenhouse gas fluxes from perennial forage grasses and annual crops amended with pig manure and inorganic fertilizer.

Project description:
Manure can serve as a comparable source of N as synthetic fertilizer; however, soil greenhouse gas (GHG) emissions may differ substantially between these two N sources. Models are good tools for estimating greenhouse gas fluxes from agricultural lands. They can be used to determine management efficiency in mitigating greenhouse gas (GHG) fluxes from agriculture. This study measures and simulates GHG fluxes from different management systems, perennial forage grasses vs annual cropping system, liquid pig manure vs solid pig manure, liquid pig manure vs urea fertilizer. The simulation model used is the Denitrification and Decomposition Model (DNDC) developed by Li et. al. (1992).

Specific objectives:
The specific objectives of the study were to

(i) measure and compare nitrous oxide fluxes and plant available nitrogen from LPM (Liquid Pig Manure) and SPM (Solid Pig Manure) on a field, seeded with perennial grasses and annual crops
(ii) measure and compare GHG fluxes from liquid pig manure and urea fertilizer
(iii) estimate greenhouse gas fluxes from perennial forage grasses and annual crops amended with liquid and solid pig manure using the DNDC model

Expected contribution to knowledge
At the end of this study, the following are the expected contributions to knowledge.

1. Quantification of the amount of greenhouse gases released from liquid, solid pig manure and inorganic fertilizers applied to a sandy loam soil.

2. An understanding of greenhouse gas transfers in agricultural systems, which will help us to make an informed decision on greenhouse gas mitigation, and formulate policies to improve environmental sustainability.

Supervisor: Prof. Wole Akinremi

Previous degrees:
B. Agric. (Soil Science), Obafemi Awolowo University, Ile-Ife, Nigeria (2007)
M.Phil. (Soil Science), Obafemi Awolowo University, Ile-Ife, Nigeria (2012)
Contact:
Email: adelekmf@myumanitoba.ca