

# Physical and Chemical Transformations and Solutes Transfer in Andisol under Pig Manure Spreading

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Waste production is dramatically increasing in Réunion Island and valorisation becomes an important scientific, technologic and economic challenge for the future. Among different recycling techniques, spreading is suitable for many wastes and permits to enhance soil fertility and to use soil purification power. In contrast, with the rich literature found for temperate conditions, few studies tackle risk estimation and management of waste spreading under tropical conditions with specific climatic and agro-pedologic features. This work aims at studying the physical and chemical transformations and the solutes transfer related to pig manure spreading on a volcanic Andisol of Réunion Island.

The experimental layout was based on three columns of disturbed soil (C1, C2 and C3) of one meter height and forty centimetres diameter. Spreading was carried out on C1 and C2 whereas C3 was used as the reference. Columns were supplied with calibrated amounts of water corresponding to measured rainfall. Each soil layer (0-20, 20-40 and 40-100 cm) was equipped with a TDR probe to follow water regime and a pH electrode and redox electrode to monitorate chemical properties. Sensors were connected to a datalogger operating at a ten minutes time step. Micro samplers were inserted at the same levels to analyse the changes in soil solution chemical composition. By comparing C1 and C2 with reference, we observed several effects of pig manure spreading: (i) an increase in electric conductivity related to an important nitrate production in topsoil layer, (ii) an acidification of topsoil layer, (iii) a saturation of soil exchange complex by potassium, (iv) a copper accumulation in topsoil layer creating a local pollution source, and (v) a deep transfer of nitrate and zinc hence a risk of groundwater pollution.

This abstract is submitted for oral presentation in symposia:

- (i) Buffering Functions of Soils;
- (ii) Soil and Water;
- (iii) Soil Monitoring.

If this abstract is refused for oral presentation, we still would like to present a poster in session "Buffering Functions of Soils".