

Partnerships aimed at adding value to organic matter on Reunion Island

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Abstract

The rational management of organic matter produced locally by agricultural, agro-industrial and urban units is a real challenge for Reunion Island. However, this organic matter represents an important opportunity for sugarcane farmers who are heavily dependent on the importation of mineral fertilisers. Four projects have been initiated to optimize the use of these resources from agronomic, economic and environmental perspectives.

These projects propose to answer four major questions about the optimal use of organic matter resources to replace mineral fertilisers either totally or partially: 1) what are the environmental impacts; 2) what are their fertilising properties; 3) how to optimize fertilisation advice to farmers; and 4) how to manage the available materials?

In response, CIRAD through the SOERE-PRO project, is assessing the environmental impacts of organic matter applications by means of a highly instrumented experimental system. This includes time domain reflectometry and use of tensiometers, lysimeters and an automated soil gas flux measurement system for N₂O and CO₂ determinations. This mechanism allows the impacts of organic matter to be followed within the soil, air, water and plant 'compartments'. At the same time, eRcane and CTICS, within the TERO project, are utilizing four test sites, corresponding to different soil and climate conditions, to characterize the composition of organic matter and evaluate their nitrogen (N) fertilising power. This will be done by determining apparent use coefficients and equivalences to fertiliser N. Closer to the farmers, the Ferti-Sol project of *La Chambre d'Agriculture* proposes to use soil analyses to develop balanced fertilisation trials with organic residues and mineral fertilisers. The use of these manures will be compared to the farmers' current fertilisation practices. The results will provide fertilisation advices that will allow for the farmers to improve their practices. Finally, in order to optimize the management of organic matter, the multi-partnership Gabir project, led by CIRAD, will analyze the biomass transfers between stakeholders. They will also simulate various valuation scenarios based on the principles of a circular economy.

These four projects are conducted in partnership and complementarity by the following research and development organizations: CIRAD, eRcane, CTICS and *Chambre d'Agriculture*. This initiative reflects Reunion Island's intention for sustainable management of the territory resources over the long term, especially through agriculture.

Keywords: sugarcane, organic matter, network, fertilisation, advice.