

# *les dossiers* **d'AGROPOLIS** INTERNATIONAL

*Expertise of the scientific community  
in the Languedoc-Roussillon region*





▲ Use of a near-infrared field spectrometer for agricultural and energy characterization of poultry litter.

## Choice of waste recovery mode based on waste characterization by near-infrared spectroscopy

On Réunion, the increasing production of organic waste (water treatment plant sludge, fermentable fraction of household waste, green waste, manure and agri-food waste), referred to as exogenous organic matter (MOEx), goes hand in hand with the increase in both population and animal husbandry. The island's insularity and isolation make it impossible to export the MOEx; it must be locally managed. There are two possible ways of recovery: ❶ to maintain and enhance soil fertility, ❷ to produce renewable energy. The choice of the most appropriate recovery mode can be eased if a typology of MOEx is drawn up, to assess value vs. risk (e.g., with respect to greenhouse gas emissions). The development of MOEx characterization tools represents a scientific challenge: to decide how it should be managed in a context of sustainable development.

Near-infrared spectroscopy (NIRS), a qualitative and quantitative technique, is the tool used. Calibration is required to convert an observed spectrum into a valuable parameter (e.g. concentration of a particular component) using statistical tools. The model developed is then used to predict the parameter in question from NIRS spectra of samples of a nature similar to those in the calibration range. NIRS is used to compile baseline data sets in the field or in the laboratory: transformative potential of nitrogen and carbon ("humus" potential), combustion potential, methane potential. This technique, when applied to MOEx in the raw state or during processing (e.g. composting and anaerobic digestion), should allow data to be generated reliably, quickly and at low cost so as to evaluate different scenarios for using these resources.

Contact: Laurent Thuriès, [laurent.thuries@cirad.fr](mailto:laurent.thuries@cirad.fr)