

**Year of CfP: 2010**

**Project 1002-006**

<b>Project title:</b> InfraRed Spectrometry as a tool to model inorganic and organic phosphorus availability in tropical soils under conservation systems
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**Unit managing the project:** UMR 210 Eco&Sols "Functional Ecology and Biogeochemistry of Soils and Agro-ecosystems" (CIRAD, INRA, IRD, Montpellier SupAgro)

**Project leaders:** Becquer Thierry (thierry.becquer@ird.fr)

**Countries involved in the project:** Brazil, Madagascar, Switzerland

**Subthematic axes:** STDI-1 (Socio-Technical Dynamics of Innovation 1: *Agri-environmental innovations, agri-ecosystems, resources management*)

**Objectives:**

This project, developed in partnership between the UMR Eco&Sols, of the "Institut de Recherche pour le Développement" (IRD), France, the Department of Agronomy of the University of Londrina, Brazil, and the Laboratory of Radio-Isotopes (LRI) of the University of Antananarivo, Madagascar, aims at understanding how conservation agriculture affects the availability of phosphorus (P) to crops in various soil conditions in the tropics. In a context of limited P availability and low mineral fertilizer inputs, as in most developing countries, we hypothesize that practices used in conservation agriculture systems, such as organic matter incorporation and implementation of appropriate crop rotations, including legumes, favor an increase of P availability. Nevertheless, the soil characteristics, notably their mineralogy, also regulate the availability of P.

The specific objective of this study is to investigate the potential use of infrared reflectance spectroscopy (IRS) as a tool for the assessment of the mineralogy, P forms and availability over a wide range of tropical soils. It has advantages over some of the conventional techniques of soil analysis, e.g. it is rapid, timely and less expensive, and does not use environmentally harmful chemical extractants. Nevertheless, if this methodology yielded good results for carbon analysis, relatively few analyses were realized at this time on the mineralogy and P forms and availability.

**Total Agropolis Fondation funding:** €19,760

**Funding categorie(s):** Work mission of professors, faculty members, scientists and/or researchers, Study missions for PhD students

**Project duration:** 01 Juin 2011 – 31 May 2013

**Keywords:** Availability of phosphorus (P), soil, infrared reflectance spectroscopy (IRS)