Ouagadougou (Burkina Faso); unamended soil was used as the control. The impact of pathogens on the total indigenous bacterial community and the risk of spreading the pathogens was assessed by counting culturable bacteria (heterotrophic cultivable microflora, faecal indicator bacteria and pathogenic human species); in addition an analysis of the genetic structure of bacterial community in a culture independent approach (method for automated ribosomal intergenic spacer analysis [ARISA]) was carried out. The results showed a total cultivable bacteria enrichment and modification of the genetic structure of bacterial communities in the amended plots. The lack of detection of pathogens such as enterococci and fecal coliform, *Staphylococcus aureus* or opportunistic human pathogens (*Pseudomonas aeruginosa*) suggested that the amendments are not sources of these pathogens and do not select the communities. However, monitoring populations of the species *Stenotrophomonas maltophilia*, an opportunistic pathogen of humans frequently found in soils, showed the enrichment of these populations in amended plots. This work showed that applying urban waste water on agricultural land may pose health and environmental risks.

Ecological intensification of agricultural production systems through waste recycling

Saint Macary, H.[1], Houot, S.[2], Cambier, P.[2], Aubry, S. P.[3], Paillat, C. J.M.[4,1], Parnaudeau, V.[4], Doelsch, E. [5,1], Ndour, Y.B.[6], Masse, D.[7], Rabeharisoa, L.[8], Masion, A.[5], Zélem, M. C.[9], Paillat-Jarousseau, H.[10], Guerrin, F.[11,12]

[1]CIRAD, UPR Recyclage et risque, Montpellier (F) Corresponding author : herve.saint_macary@cirad.fr
[2]INRA, UMR EGC, Grignon (F)
[3]INRA, UMR Sadapt, Paris (F)
[4]INRA, UMR SAS, Rennes (F)
[5]CNRS, UMR CEREGE, Aix en Provence (F)
[6]ISRA/LNRPV, Dakar (SEN)
[7]IRD, UMR Eco & Sols, LEMSAT, Dakar (SEN)
[8]Université Antananarivo, LRI, Antananarivo (MGR)
[9]CUFR, URT Speed, Albi (F)
[10]UCO, CERIPSA, Angers (F)
[11]CIRAD, UPR Recyclage et risque, Saint Denis de la Réunion (F)
[12]INRA Biometrics and Artificial Intelligence Research Unit, Toulouse (F)

Abstract

Organic waste (OW) generated by human activity is continuously increasing worldwide. Agriculture generates large amounts of OW derived mostly from livestock farming and agro-industries. Furthermore, OW flows are increasing as a result of urban development—wastewater, sludge and municipal waste may be treated to different degrees. These wastes are often applied on cultivated lands on the outskirts of cities. OW are sources of organic matter that may increase soil fertility and reduce the need for chemical fertilizers, thus enhancing sustainable agricultural production. They may also carry contaminants, and inappropriate application may lead to an accumulation of mineral, organic or metallic contamination, thus degrading soil quality and possibly increasing the risk of pollutant transfer to the harvested crops. The multiplication of product types and the diversity of situations in which they are produced and used are factors that should be considered to enhance OW management in agriculture. The ISARD project aims to develop a global approach for integrating knowledge concerning OW recycling in agriculture. Innovation in this project is related to the territorial approach with organic matter stemming from either agriculture or households, and mainly in suburban areas. The project is being implemented at four locations, with the following specific recycling issues:

- Metropolitan Dakar (Senegal): possible ways of using mixed composts
- Mahajanga region (Madagascar): making and using municipal waste compost

- Versailles area (France): recycling stable manure and wastewater treatment sludge on cultivated plots
- Réunion Island (France, Indian Ocean): organizing and assessing the recycling of various wastes at a territory level

The expected result to be delivered when the project is completed is a generic methodology that will make it possible for agronomists working with rural stakeholders to create highly efficient cropping and farming systems based on the use of a wide range of organic wastes.

The determinants of organic fertilizers used in urban and peri-urban agriculture: an econometric analysis

Sotamenou, J.[1], Parrot, L.[2]

[1]Lecturer, University of Yaoundé II – Soa, Faculty of Economics and Management, P.O. Box 1365, Yaoundé, Cameroon. E-mail: sotamenou@yahoo.fr
[2]Centre de Coopération Internationale en Recherche, Agronomique pour le Développement (CIRAD), UR Hortsys, Boulevard de La Lironde, Montpellier 34398 Cedex 5, France. E-mail: laurent.parrot@cirad.fr

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Abstract

Urban poverty, increases in food demand, land pressures, pollution resulting from solid waste generation and from mineral fertilizers uses in urban and peri-urban agriculture, are becoming real issues in agriculture in Cameroon, and there is a growing need for organic fertilizers that result from solid waste recycling. Urban and peri-urban agriculture are potential regular users of large quantities of household wastes and compost; but these organic fertilizers are indeed scarcely used. This study proposes using a binomial Logit model on the one hand, to identify factors to encourage using compost in the urban and peri-urban lowlands in Cameroon, and on the other hand, to highlight the effects of these factors on different levels of fertilization using an ordered Logit model. Using a representative sample of 288 farmers, it was found that 41% of farmers use mixed compost and mineral fertilizer, 22% of them use mineral fertilizers exclusively, and 15% use compost exclusively. However, 23% of the farmers in Cameroon do not use any fertilizers. The binomial Logit model estimations show that variables like membership in farmers' cooperatives, land property rights, food cultivation, low levels of farm income and the distance between farmers' dwellings and their farms have an effect on whether compost is used in urban and peri-urban areas in Cameroon. In addition, the ordered Logit model estimation shows that the variables like land-property rights, food cultivation, the available chemical input budget and the distance between dwellings and farms explains fertilization at all levels. In light of these results, a participative solid waste management plan that encourages local composting in the lowlands would help to reduce pollution resulting from solid wastes while promoting the development of the urban and peri-urban urban agriculture.