



Environmental risk assessment of the use of different organic wastes as soil amendments

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The use of organic wastes in agriculture is considered a way of maintaining or restoring the quality of soils, enlarging the slow cycling soil organic carbon pool. However, a wide variety of undesired substances, such as potentially trace elements and organic contaminants, can have adverse effects on the environment. That fact was highlighted by the Proposal for a Soil Framework Directive, which recognized that “soil degradation or soil improvements have a major impact on other areas, (...) such as surface waters and groundwater, human health, climate change, protection of nature and biodiversity, and food safety”. Taking that into account, the research project “ResOrgRisk” aims to assess the environmental risk involved in the use of different organic wastes as soil amendments, evidencing their benefits and constraints, and defining the most suitable tests to reach such assessment. The organic wastes selected for this purpose were: sewage sludge, limed, not limed, and co-composted with agricultural wastes, agro-industrial sludge, mixed municipal solid waste compost, compost produced from organic farming residues, and pig slurry digestate.

Whereas threshold values for heavy metals in sludge used for agriculture have been set by the European Commission, actually there is no definitive European legislation for organic contaminants. Guide values for some organic contaminants (e.g. polychlorinated biphenyls - PCBs, and polycyclic aromatic hydrocarbons - PAHs) have been adopted at national level by many European countries, such as Portugal. These values should be taken into account when assessing the risk involved in the use of organic wastes as soil amendments. However, chemical analysis of organic waste often gives scarce information because it does not include possible interactions between chemicals. Furthermore, an exhaustive identification and quantification of all substances is impractical. In this study, ecotoxicological tests (comprising solid and aquatic phases) were performed to obtain an integrated assessment on the effects of all contaminants from each organic waste, as a whole, to terrestrial systems. The results for the chemical and ecotoxicological characterization of the organic wastes selected in this study will be discussed, emphasizing the potential benefits and the risks of their use as soil amendments.