ESTABLISHMENT OF WEIGHTED INDICATORS FOR THE EVALUATION OF AGRICULTURAL WASTE TREATMENT TECHNOLOGIES

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ABSTRACT

Agricultural wastes (AW) which are produced in large volumes in all Mediterranean countries are often characterized by seasonal production and substantial contamination potential. Thus, various technologies have been developed for their treatment in order to prevent the adverse impacts caused by their uncontrolled disposal on soil and water bodies as well as for their valorisation. In the line of WasteReuse project "Best practices for Agricultural Wastes (AW) treatment and reuse in the Mediterranean countries" LIFE10 ENV/GR/594, co-funded by EC LIFE+ Environment Policy & Governance, weighted technical, environmental, economic and socio-cultural indicators have been established for the evaluation of the most important AW treatment technologies developed so far mainly through European Commission (EC) funding. In this study emphasis is given to the technologies aiming to produce compost and water which can be used as soil improver or for irrigation respectively, increasing thus crop yield especially in areas suffering from desertification and improving the long term sustainability of agriculture in the Mediterranean region.

Keywords: *weighted indicators, agricultural waste treatment, compost*

1. INTRODUCTION

The largest volumes of AW in the Mediterranean region are produced from olive oil mills, winery, swine and dairy cattle facilities, and various other agricultural activities. Although the volume of wastes produced by the agricultural sector is smaller compared to the volume generated by other industrial sectors, their contamination potential can be often substantial (Agele et al., 2011; Rodriguez-Caballero et al., 2012; Lim et al., 2012). For example, application of manure on crop land may decrease soil permeability and adversely affect crop growth due to the inhibitory amounts of nitrogen, phosphorus or salts added on soil and may also cause eutrophication of water bodies or contamination of drinking water (Anderson et al., 2002; Teglia et al., 2011; Tsai et al., 2012; Fernández-Hernández et al., 2012).

However, if AW are treated, useful by-products such as compost and clean water can be produced that can be used in agriculture to cover fertilization and irrigation needs after evaluation of their suitability to improve soil quality and support plant growth without causing phytotoxicity, contamination of water bodies or other environmental impacts. Other benefits of such treatment include reduction of raw materials consumption (eg. phosphate ores which are used for the production of fertilizers), reduction of carbon footprint and elimination of environmental risks (Griffiths et al., 2010; Tontti et al., 2011; Komnitsas and Zaharaki, 2012; Saunders et al., 2012).

So far, several projects aiming at the development of AW treatment technologies for the production of useful by-products, the recovery of valuable constituents, the production of energy and minimization of adverse environmental effects have been funded within

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