

Best practices for Agricultural Wastes (AW) treatment and reuse in the Mediterranean countries (WasteReuse)

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Abstract

The WasteReuse project “Best practices for Agricultural Wastes (AW) treatment and reuse in the Mediterranean countries”, LIFE10 ENV/GR/594, which started on 1/9/2011 and will last until 31/8/2015, is co-funded by EC LIFE+ Environment Policy & Governance. WasteReuse addresses two significant environmental problems related to a) the uncontrolled disposal and use of agricultural waste (AW) such as olive oil mill, wine and swine waste etc. for crops/land fertilization and irrigation, and b) the excessive use of nutrients and natural resources (water, phosphate ores used for the production of fertilizers etc.) and investigates the possibility to increase recycling of nutrients and water. Its main objectives are to evaluate innovative and traditional technologies for AW treatment regarding their suitability for crop cultivation, develop alternative cultivation practices for the most widely cultivated crops, as well as protect soil quality from the disposal of AW, reduce carbon footprint, increase competitiveness and improve sustainability of agriculture in the Mediterranean region.

So far, an inventory of all available technologies for AW treatment was developed and a preliminary techno-economical and environmental evaluation of these technologies was carried out. Various soils from Spain, Italy and Greece, as well as treated and untreated AW, are characterized to assess their suitability for crop cultivation; phytotoxicity tests are in progress using the wastes selected and different plants as indicators. Regarding dissemination, project leaflets and posters were printed in English, Greek, Italian, Spanish and French, while a newsletter was sent to all Greek agricultural co-operatives and several daily newspapers circulated in Crete, Greece.

Keywords

Agricultural waste, cultivation practices, risk analysis, phytotoxicity

Introduction

AW include both natural (organic) and non-natural wastes produced from various activities such as dairy farming, horticulture, seed growing, livestock breeding, grazing land, gardens, nursery plots and even woodlands. AW can be solid, liquid or in the form of slurry depending on the nature of the activity, are mainly characterized by seasonal production and should be rapidly removed from the field to avoid interferences with other agricultural activities [1].

Although the quantity of wastes produced by the agricultural sector is significantly lower compared to wastes produced by other industries, their pollution potential is usually very high. AW have a high content of recalcitrant compounds and are characterized as potentially hazardous and toxic when disposed untreated on soil or in water bodies. Application of AW on land may adversely affect crop growth and result in eutrophication of water bodies or contamination of drinking water [2, 3].

However, if AW are treated and reused, valuable by-products can be produced such as compost, treated liquid waste for fertilization and irrigation and energy. Other benefits include reduction of raw materials use (eg. phosphates for fertilizers), carbon footprint and environmental risk. In this framework, WasteReuse aims to treat and reuse AW and contribute to the long term sustainability of the agricultural sector in the Mediterranean region.

Therefore, the main objectives of the project are:

- Evaluation of innovative and traditional technologies for AW treatment regarding their suitability for crop cultivation (irrigation and fertilization)
- Development of Alternative Cultivation Practices for the most widely cultivated and water consuming crops (e.g. vegetables, cereals) in the Mediterranean by recycling nutrients and water