POLICYBRIEF

Best practices for Agricultural Wastes Treatment and Reuse in the Mediterranean Countries

Policy-relevant findings from the WASTEREUSE project LIFE10 ENV/GR/594

Policy Brief 2 – May 2015 **On-going Project**

INTRODUCTION

WasteReuse aims to develop new and alternative agricultural practices with the use of treated - or potentially untreated - agricultural waste (AW), which affects, besides the production itself, the quality of soil, water and air by considering the effect of the significant parameters as soil properties, soil-climate relation and environmental conditions.

What is Agricultural Waste

Agricultural wastes (AW) can be defined as the residues from the growing and first processing of raw agricultural products such as fruits, vegetables, meat, poultry, dairy products and crops. This term includes both natural (organic) and non-natural wastes produced through various farming activities such as dairy farming, horticulture, seed growing, livestock breeding, grazing land, market gardens, nursery plots and even woodlands. The agricultural industry generates mainly liquid and solid residues with a high load of organic matter. The seasonal character of this type of industry means that high amounts of residues are generated in a short period of time.

High pollution potential of Agricultural Waste

The environmental impact of this kind of residues is considered significant and a sustainable management plan is required to avoid environmental degradation. Their inappropriate disposal causes soil and aquifer

contamination as well as, emission of gases such as methane, ammonium and carbon dioxide to the atmosphere. The presence organic matter contained in these residues in superficial or groundwater can cause reduction of dissolved oxygen and fish death, production and emission of biogas, formation of a film of floating material and also eutrophication. When solid concentration in wastewaters is high, sediments can be formed in the bottom of the receiving waters where anaerobic degradation can take place with consequent production of bad odours. Water can also be contaminated by residual pesticides and other agrochemicals contained in wastewaters. In soils, wastes cause increase in N content which, further undergoes slow mineralization; only part of this N is used by crops and the rest is lixiviated contaminating groundwater with NO3- ions, which degrade aquatic environment and become harmful for human health.

AW in Mediterranean countries

Large quantities of AW are produced annually in the Mediterranean region. AW produced in Mediterranean countries, depend on the agricultural activity and contain residues from the processing of raw agricultural products such as fruits, vegetables, meat, poultry, dairy products and crops. For example, it is estimated that cereal cultivation produces about 5.5-11.0 tons dry matter of residues per ha, residues from woody tree pruning constitute about 1.3-3.0 tons dry matter per ha, while the average total production of Olive Oil Mills Wastes ranges between 10 x106 and 12×106 m3 and occurs over a brief period of the year (November-March). These examples give an idea of the huge amount of residues generated and the necessity for developing sustainable management plans, which will include recycling and reuse.

High environmental and economic benefits from reusing AW

The reuse of AW for crop cultivation may, without doubt, offer a series of environmental and economic benefits. The rationale for reusing AW is based on the environmental benefits from applying a sound method of waste management and on the economic benefits due to the reduction of commercial fertilizers use. Since agricultural wastes are rich in inorganic nutrients and organic matter, recycling of this type of wastes in agriculture would have multiple positive effects to the environment and to agricultural productivity. With regard to the environment the main benefits are:

- Increase of water infiltration and retention
- Inhibition of pests and diseases
- Pollution reduction
- Erosion prevention
- Healthy growth promotion
- Toxins reduction

- Support climate change mitigation by increasing soil organic matter (and reducing greenhouse gases emission.

The most important economic benefits from the reuse of AW are:

- Higher yields
- Inorganic fertilizer substitution: The use of composts or organic materials enriches soil with slow release, crop-available nutrients, which in the long-term may further reduce the use of mineral fertilizers. Fertilizer and pesticide costs are generally also reduced on a sustainably managed farm because crop rotations tend to be less expensive than their synthetic alternatives
- Improvement of soil structure for better workability and better crop establishment, saving fuel and time

Policy Recommendations

Encourage regular soil analysis for the safe use of AW

Prior to the selection and application of any cultivation practice, the soil to be cultivated should be analysed for a series of parameters that determine its quality and fertility. The use of AW makes this analysis even more important in order to define any potential adverse effects caused to soil health due to previous practices or waste use. Soil analysis is therefore a practice that should be adopted by farmers, who should be informed appropriately and encouraged by competent authorities in all EU countries to regularly analyse the soil in order to determine its level of available nutrients before establishing the baseline level of micronutrients.

Implement a comprehensive monitoring system for AW reuse

Monitoring of AW reuse should be performed by local, regional or governmental authorities, but farmers could also play a significant role in monitoring and maintaining soil and water quality. An effective monitoring system has to consider the geomorphology, the hydrology, the soil types of the application area, the peculiarities and the characteristics of the produced AW as well as, the local meteorological conditions.

It is, therefore, recommended that a monitoring tool fully suited to AW reuse in the agricultural sector would be implemented and should include:

- An optimized set of soil quality indicators
- Threshold values for the quality indicators
- Periodical soil and water quality monitoring

Introduce a common legal framework on the reuse of AW at EU level

At the moment, the rules and standards for the use of compost vary considerably across Member States. Some countries have a dense and coherent net of regulations on national and/or on provincial level and other allow for compost to be used without any legal directions. As coherent approaches to policy, standards, quality assurance and market development have produced in many relevant environmental, health and safety and industrial fields positive outcomes, it would be highly beneficial for the agricultural sector and for the environment to create a coherent EU regulatory framework for compost.

Include by products in the waste regulations

Until now by products can be freely recycled as soil improvers and fertilizers, but these materials should be subject to overall generic controls and there should be further specific controls for each group according to their properties and progressively detailed information should be required according to the class of waste. Therefore, prior spreading by products on land, their suitability should be proved and checked by a competent authority.

Suitable wastes need to be defined through an appropriate chemical/physical characterization and, if appropriate, grouped into broad categories to make for a workable classification for use across the EU. This classification is considered fundamental for the collection of coherent information and for making sensible comparisons and it should be somehow regulated and harmonized throughout the EU.

Regulate and control composting areas and facilities

Permits for on-farm composting operations are generally not required for small to medium size facilities that don't sell finished compost products on a wholesale or retail basis. Nevertheless, a well-run facility must operate in compliance with the national and local regulations pertaining to surface water, ground water and odors. A site for an agricultural composting facility must furthermore provide the required area and conditions for all weather composting as well as limit the environmental risk associated with odor, noise, dust, leaching, and surface water runoff. In order to be able to steer and monitor the choice for composting areas and facilities clear and transparent regulation, on all levels ranging from local to European, would be of high importance in order to control the environmental impacts.

Standardize the composition and application of compost

The application of compost has to respect environmental parameters. Many of the maximum loads of PTEs to the soil defined in European standards and

regulations are stemming from traditional sewage sludge regulations or are calculated from quantitative compost limitations multiplied by heavy metal threshold values. In this respect it is considered as highly beneficial, for both end users and for the environment, if metal loads on soil will be laid down according to specific standards that should be adopted in all Member States.

Furthermore, a common framework for the chemical composition, testing, certification and use of compost in the EU should take into account various parameters, such as the acceptable quantities of foreign matter in compost, the required hygiene and related worker safety standards, the PTEs specific to compost, the pesticide and especially herbicide residue content of organic wastes, and the phytotoxicity tests.

Project Identity

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WEBSITE: http://www.wastereuse.eu