



LIFE + Environment Policy and Governance

Project Number: LIFE10 ENV/GR/594

Duration: 01/09/2011 – 31/08/2015



Project: Best Practices for Agricultural Wastes
Treatment and Reuse in the Mediterranean
countries

www.wastereuse.eu

Action 8 – Code of Waste Management Practices for
Agricultural Application

Period: 05/05/2014 – 31/08/2015

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Deliverable due date: 30/05/2015

Deliverable submitted on: 30/05/2015

Executive Summary

The Code of Waste Management Practices for Agricultural Application, aims to provide farmers all appropriate technical and practical data for AW reuse in agriculture and to the policy makers assistance to design and implement monitoring actions that will ensure sustainable reuse of AW and protection of natural resources (i.e. soil and water).

The code is built upon two parts:

- Part A includes data, information and knowledge gained so far on the issue “Agricultural Wastes” and their reuse in agriculture. The main types of agricultural waste produced in the Mediterranean region, their quantities, properties, characteristics and also their reuse potential is presented in part A of the Code, which also includes presentation of the methods and tests, used worldwide, for AW toxicity assessment. The methods for assessing wastes toxicity, soil and water toxicity as well as risk assessment for humans due to fertilizers application are explained in detail. The issue of reusing agricultural wastes is approached through an extensive analysis of the respective EU legislative framework and through the presentation of the various standards and national regulations for composts. Composts, are of particular importance for the promotion of waste reuse and present a solution with many benefits to agriculture,. The main differences between national regulations regarding composts were identified and presented while appropriate data for assessing safety and nutritional status, handling, storage, application practices and precautions are given in detail. Since controlled use of AW ensures sustainability for the environment and also economic benefits for the farmers, the Code includes a specific section regarding the assessment of composts nutritional status and the methodologies for doses calculation. This analysis documents and introduces the Part B of this Code, in which specific cultivation practices with the use of AW are presented and proposed as alternatives to the conventional ones, based however on sustainability principles.
- Part B of the Code discusses the proposed measures that should be adopted and implemented by farmers and authorities in order to ensure safe and efficient reuse, benefits for the farmers and continuous monitoring for environment protection. Eight steps are proposed considering also the until know produced knowledge on the subject and by adopting a bottom-up approach, i.e. measures that should be firstly adopted by the users and then monitored by the authorities, given that the wastes used are non hazardous and are complying with the legislative framework. The eight steps are: soil characterization, definition of quantified cultivation targets, physical-chemical-biological characterisation of the wastes to be reused, establishment of soil/water quality criteria, development of specific cultivation practices, ensure safe use of wastes and protection of workers’ and citizens’ health and finally design of a regular monitoring strategy to assess potential risks and safe reuse. The evaluated results from experimental and demonstration actions took place in Spain and Italy, aimed to identify optimum alternative cultivation practices for the most important Mediterranean crops are summarized, and analyzed comparatively. Sixty agricultural waste types were collected and

assessed as appropriate or not for reuse and cultivation of different crops. Precise guidelines for the cultivation of wheat, barley, maize, tomato, lettuce and potted crops (rosemary) are provided which include details regarding nutrients doses needed in each crop growing stage, waste and mineral fertilizers amounts to be applied, irrigation water demands as well as economic data in order the definition of the net economic benefit to be feasible. In the same chapter the results of the Life Cycle Analysis (LCA) that was carried out for the demonstration areas are explained and extensively discussed. The LCA revealed the crucial phases of the production, which substantially contribute to the global warming and also to environment degradation. Major burdens that contribute to the increase in the carbon footprint of the products are discussed and alternative practices are given. The WasteReuse Decision Making Tool proposed by the project is anticipated to assist farmers and policy makers to select the most appropriate waste types for different cultivated crops. The WDMT could be used as a Mediterranean (and in the future as a European) waste database, open for potential users from the entire basin, who can retrieve waste and cultivation data for different crops and also upload their own data, providing therefore a dynamic and continuously updated database.

- Finally, this Code includes four Annexes, which provide useful data related to soil and water quality criteria (Annex 1 and 2, respectively), the chemical analyses of the wastes used during the project demonstration actions (Annex 3) and proposed practices for cultivating different crops with the use of the wastes studied during the project and assessed as appropriate to be reused in agriculture (Annex 4).

The cultivation practices that were developed and demonstrated by the WasteReuse project with the use of AW have significant benefits for the environment, no adverse effects on soil and water bodies, while at the same time provide economical benefits to farmers. In specific, from the 60 types of organic wastes produced in the Mediterranean region and also treated by technologies developed by EU funded projects the 31 were found appropriate in terms of their physical, chemical and biological properties while 4 were selected and further used for the cultivation of different crops (tomato, lettuce, wheat, barley, maize and rosemary), aiming at developing specific practices based on the sustainable use of mineral fertilizers and irrigation water. After having examined all parameters that affect plant growth, yield, environmental sustainability and also cultivation costs, specific practices were proposed for these crops, which include all appropriate data to be implemented in all Mediterranean countries, i.e. needed amounts of AW and mineral fertilizers for each cropping period, irrigation water needed, optimum irrigation system, potential adverse effects on soil and water, most suitable soil types, periods and ways of fertilization (N, P, K) and also cultivation costs.

However, despite the sustainable practices developed and proposed by WasteReuse and in order to ensure that the reuse of AW will be safe for the environment, the responsible authorities and local farmers should adopt specific measures. For this the well-defined sequence of eight steps including specific actions and measures should be followed in order to ensure sustainable and safe reuse of organic wastes in agricultural sector.