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www.wastereuse.eu

Action 5 – Development of alternative agricultural practices.
Demonstration in greenhouse and field experiments (Spain)

“Soil quality protection by the sustainable use of treated agricultural wastes in crops cultivation”

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Contents

	Page number
Executive summary	3
1. Introduction	4
2. Soil quality and ecosystems functions	5
2.1. Soil quality	6
2.2. Soil quality indices	6
3. Role of microorganisms in soil fertility	8
4. Soil organic matter, nature and functions	8
5. Soil management strategies for a sustainable agriculture. Use of treated organic wastes as fertilizers and soil improvers	11
5.1. Effect of stabilized organic wastes on soil physical, chemical and biological fertility	12
5.1.1. Physical fertility	12
5.1.2. Chemical fertility	6
5.1.3. Biological fertility	17
5.2. Effects of stabilized organic wastes on plant nutrition and crop quality and yields	18
6. Comparative effects of new and traditional cultivation practices on soil quality	20
6.1. Protected cultivations (greenhouse)	20
6.1.1. Use of solid wastes (Composts)	20
Tomato crops	14
Lettuce crops	27
6.1.2. Use of liquid organic wastes (pig slurry liquid fraction)	32
Tomato crops	32
Lettuce crops	38
6.2. Open field cultivation using organic wastes (composts)	43
Experimental design	43
Barley crop	45
Wheat crop	48
7. Conclusions	50
8. References	51
Annex	56

Executive summary

Intensive cultivation and the failure to implement effective soil conservation practices, have led to soil degradation and decline in productivity because of excessive soil erosion and nutrient run off and the decrease in stable soil organic matter. Efforts must be taken to halt the decline in soil productivity and to restore the productivity of degraded soils in the shortest possible time. This could be achieved by a proper management and recycling of organic wastes on land to protect agricultural soils. The efficient and effective use of organic wastes as soil conditioner and fertilizers constitute one of the best means for maintaining and restoring soil productivity and quality. In addition, the production of organic wastes is increasingly worldwide and strategies for the disposal of such wastes in an environmental friendly way are necessary. Stabilized organic wastes can be used as soil amendments to increase soil fertility, since they can provide nutrients for plant growing whilst improving soil quality.

In this report, soil quality is defined and the main soil quality indices are described as well as the importance of soil ecosystem functioning. Likewise, the important role played by soil organic matter and microorganisms in soil fertility is also discussed. The suitability of using organic wastes as fertilizers and soil improvers for a sustainable agriculture has been highlighted as well as the effect of the addition of this exogenous organic matter on soil physical, chemical and biological fertility as well as its effect on plant nutrition and crop quality and yield.

Finally, the results obtained in different cultivation assays, carried out in greenhouse and open field within the WASTEREUSE project, relative to the effect on soil quality of the use of solid and liquid organic wastes as fertilizers are discussed. In greenhouse it has been studied the effect on soil quality of the addition of two different composts either, alone or in combination with inorganic fertilization, after each of two successive tomato crops and two successive lettuce crops. Also in greenhouse, the effect on soil quality of using a liquid organic waste in irrigation in two successive tomato crops and in two successive lettuce crops has been studied in comparison to conventional inorganic fertilization. The effects of the use as fertilizer and soil improvers of two composts added alone or in combination with inorganic fertilizers in barley and wheat cultivation is also discussed in this report.