

# Quality evaluation of composts in the Greek market

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**Abstract:** In recent years, many composting products of various organic residues have been placed on the Greek market. Some of the benefits of composting, in addition to protecting the environment, are saving money, reducing wastes, improving soil quality and further complying with EU environmental rules.

The main purpose of this study is to present the results of a recent online market survey of compost products on the Greek market. Also, it was assessed the quality and the agronomic characteristics of compost products or products marketed as such.

Physical and chemical parameters (moisture, organic matter, electrical conductivity, pH and concentration of nitrogen, phosphorus and potassium), listed on the labels of the products, were statistical processed for the quality and agronomic evaluation of the compost products. The largest amount of commercial compost products comes from composting solid household waste residues (32%). 61.90% of the market survey compost samples have a sum of nitrogen (N), phosphorus (P) and potassium (K), greater than 3%. The pH value ranges from 7.0 to 7.5 at the 54.55% of the samples, the conductivity equal to 2,0 mS/cm at 41.67% of the samples and organic matter equal to 40% have the 27.78% of the samples.

Results revealed wide variations even within the same group of products. The high variability of such important parameters in composts available in the Greek market suggests an urgent need for establishing quality assurance procedures and mechanisms in the country.

**Keywords:** compost, quality, agronomic, evaluation, organic matter

## 1. Introduction

Compost is a mixture of ingredients used to fertilize and improve the soil. It is commonly prepared by decomposing plant and food waste and recycling organic materials. The resulting mixture is rich in plant nutrients and beneficial organisms. Compost improves soil fertility in gardens, landscaping, horticulture, urban agriculture, and organic farming. The benefits of compost include providing nutrients to crops as fertilizer, acting as a soil conditioner, increasing the

humus or humic acid contents of the soil, and introducing beneficial colonies of microbes that help to suppress pathogens in the soil. The natural interaction of soil, plant roots, and nutrients in compost improves the soil structure, which increases the soil's water retention ability and controls soil erosion.

Compost quality refers to the overall state of the compost in regard to physical, chemical and biological characteristics, which indicate the ultimate impact of the compost on the environment (K. Lasaridi et al., 2006).

The main purpose of this study is to present the results of a recent online market survey of compost products on the Greek market and to assess the quality and the agronomic characteristics of compost products or products marketed as such.

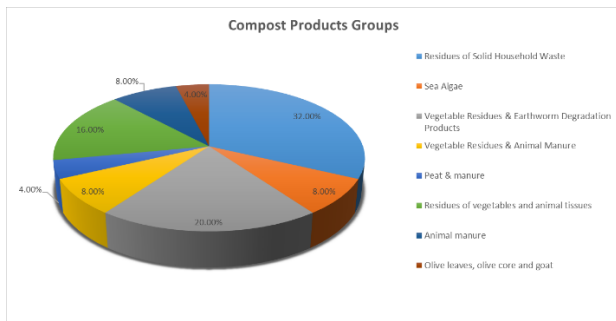
## 2. Methodology and equipment

### 2.1. Data collection and analysis

The different compost materials available on the Greek market at the time of this study (March- April 2021) were identified through desk research. A total of 25 products were identified and were classified into eight groups according to their origin of Organic Matter (**Table 1** and **Figure 1**).

**Table 1.** Compost products groups

No	Origin of Organic Matter	%
01	Residues of Solid Household Waste	32
02	Sea Algae	8
03	Vegetable Residues & Earthworm Degradation Products	20
04	Vegetable Residues & Animal Manure	8
05	Peat & manure	4
06	Residues of vegetables and animal tissues	16
07	Animal manure	18
08	Olive leaves, olive core and goat	4



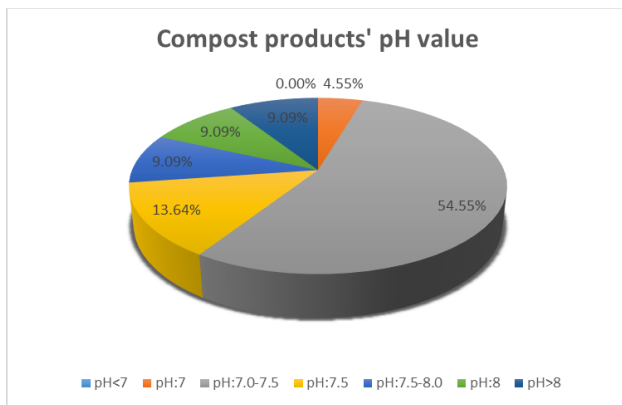
**Figure 1.** Compost products' groups

## 2.2. Quality evaluation of composts products approach

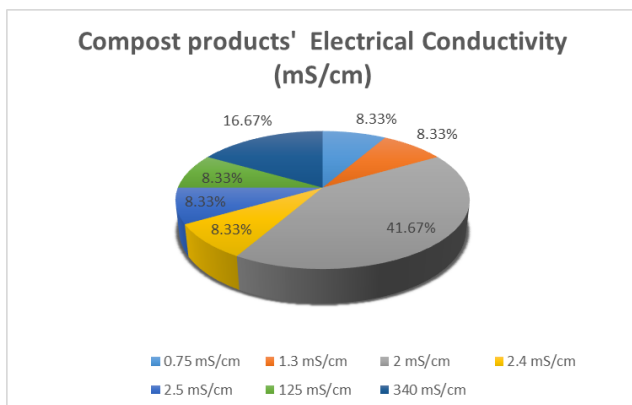
Physical and chemical parameters (moisture, organic matter, electrical conductivity, pH and concentration of nitrogen, phosphorus and potassium), listed on the labels of the products, were statistical processed for the quality and agronomic evaluation of the compost products.

## 3. Results

As shown in **Figure 2**, the pH value ranges from 7.0 to 7.5 in the largest percentage of samples (54.55%) and as shown in **Figure 3**, the conductivity of the largest percentage of samples (41.67%) equals to 2,0 mS/cm.



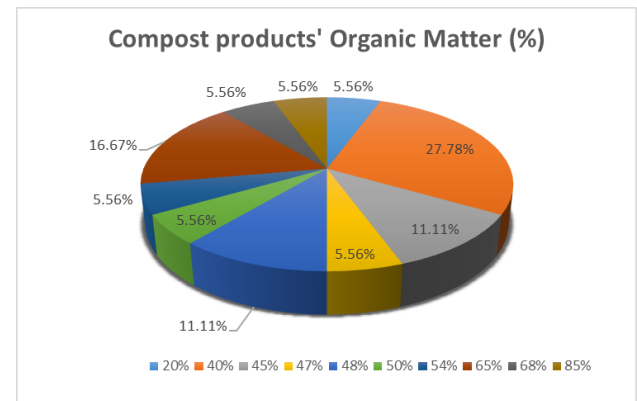
**Figure 2.** Compost products' pH Value



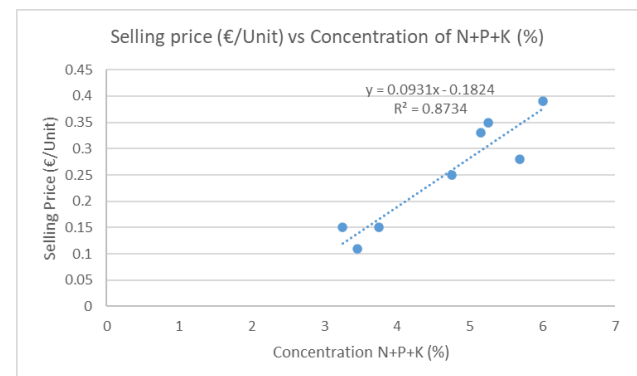
**Figure 3.** Compost products' Electrical Conductivity

It is also worth noting that the organic matter (OM) of the examined samples varies and the 27.78% of them have a percentage of OM equal to: 40% (**Figure 4**). Also, the 61.90% of the market research compost samples have sum of nitrogen (N), phosphorus (P) and potassium (K), greater than 3%.

Finally, it is of real interest the fact that the increase in the concentration of composting packaged products in nitrogen, phosphorus and potassium has the effect of increasing the selling price of the products (**Figure 5**) almost linearly ( $R^2=0.87\%$ ).



**Figure 4.** Compost products' Organic Matter



**Figure 5.** Selling price vs Concentration N+P+K (%)

The high variability of such important parameters in composts available on the Greek market suggests an urgent need for establishing quality assurance procedures and mechanisms in the country. Moreover, the wide range of limit values within EU member states suggests the need for developing EU compost quality standards, in order to harmonize the compost markets (K. Lasaridi et al., 2006).

## 4. Conclusions

The pH value ranges from 7.0 to 7.5 in the largest percentage of samples (54.55%) and the conductivity of the largest percentage of samples (41.67%) equals to 2,0 mS/cm. The organic matter (OM) of the examined samples varies and the 27.78% of them have a

percentage of OM equal to: 40%. The 61.90% of the market research compost samples have sum of nitrogen (N), phosphorus (P) and potassium (K), greater than 3%. The increase in the concentration of composting packaged products in nitrogen, phosphorus and potassium has the effect of increasing the selling price of the products almost linearly.

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