Handbook for compost marketing

Project funded by the EUROPEAN UNION

ENPI CBCMED
CROSS-BORDER COOPERATION IN THE MEDITERRANEAN

SCOW
Selective collection of the organic waste in tourist areas

About

SCOW is the abbreviation of Selective Collection of the Organic Waste in tourist areas and valorisation in small-scale composting plants. This is an European project of 3 years (2013-2015) funded by the Program ENPI CBC Med (Cross-Border-Cooperation in the Mediterranean), which has as its aim the development of new models for the recollection and recycling of organic waste in areas with both tourist and agricultural activity.

The SCOW project aims the definition of an innovative and sustainable management system for organic matter. It seeks a collection and a recycling of low cost, technically simple and of high quality. The effectiveness of the system is related to the implantation of door to door collection systems and the creation of small scale composting plants distributed in a decentralized way in the territory, located near the places of generation of the organic matter and also where obtained compost can be used.

The partners of the SCOW project are: Urban Ecology Agency of Barcelona (leader partner) (Spain), Development Agency Gal Genovese (Italy), Local Government Association (Malta), House of Water and Environment (Palestinian Authority), Upper Galilee Regional Council (Israel), MIGAL – Galilee Research Institute (Israel), SYVADEC (SIRET) (France) and Environment Park SpA (Italy).

Find more information on the SCOW project via: http://www.biowaste-scow.eu/

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Disclaimer

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The SCOW project is a multilateral Cross-Border Cooperation initiative funded by the European Neighbourhood and Partnership Instrument (ENPI). The Programme objective is to promote the sustainable and harmonious cooperation process at the Mediterranean Basin level by dealing with the common challenges and enhancing its endogenous potential. It finances cooperation projects as a contribution to the economic, social, environmental and cultural development of the Mediterranean region.

The following 14 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Malta, Palestinian Authority, Portugal, Spain, Syria, Tunisia. The Joint Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English and French.

The project SCOW is implemented under the SCOW Project. Its total budget is [4.97 million Euro] and it is financed, [for an amount of 4.47million Euro]1, by the European Union through the European Neighbourhood and Partnership Instrument. The ENPI CBC Med Programme aims at reinforcing cooperation between the European Union and partner countries regions placed along the shores of the Mediterranean Sea.

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1 Introduction

One of the main considerations in many composting facilities or composting projects is how the compost produced is going to be managed. In some cases this is not considered in the economic balance of the facility. There is a general belief that no one will want the compost or there is a lack of knowledge regarding which properties the output must fulfil to truly become "compost".

Howeverthere are also many examples of facilities that not only treat organic waste, but also transform waste into valuable product/s that are commercialized and sold, even when waste is located hundreds kilometres away.

The difference is a mix of circumstances of each facility, in addition to a balance between knowledge of the process and the materials, long-term strategy and marketing techniques.

This handbook simulates information, ideas and hints to those small-size composting facilities that are just starting out or are at the initial project stage and need to define how they will manage the produced compost.

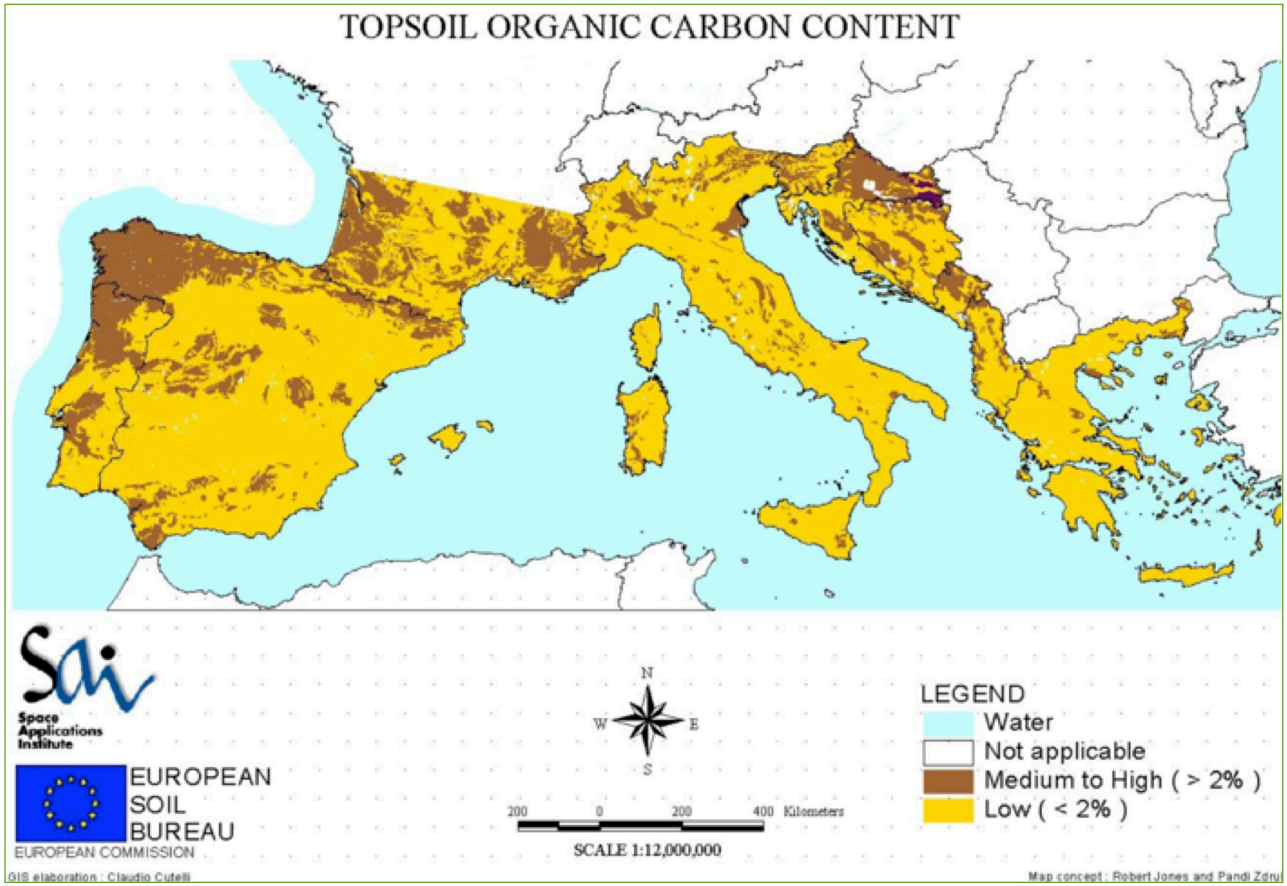
2 The importance of the organic matter

The welfare of a population can be linked to fertility and land productivity. These health indicators are directly related to the organic matter content of the soils and are less related to factors regarding water availability. Moreover, agriculture has a significant effect on the contents of soil organic matter, causing loss through nutrient over consumption, exposure to air, erosion (Montanarella, 2002).

The use of fertilizers to maintain soil productivity in Europe is estimated at 17 Mt per year. Although this data is modest in comparison to China, which consumes 47 Mt per year, or with the United States where only maize uses 10 Mt of fertilizers by year (Kluger, 2010). The energy costs involved to produce this amount of fertilizer would be between 37 and 130 MJ per each kilogram of nitrogen fixed from the atmosphere (depending on method used) (Flotats, 1999). In addition, greenhouse gases generated in production should be included in the balance sheet (Favoino & Hogg, 2002).

The annual loss of organic matter in topsoil varies greatly depending on farming practices, crop type, soil drainage and weather conditions (Waterrs & Oades, 1991).Unless the organic matter is quickly replaced, the system enters a state of continuous degradation which will eventually lead to its unsustainability (World Bank, 1993).Different factors like desertification, land degradation and drought affect over 1.5 billion people in more than 110 countries, 90% of whom live in low income areas. It means that annually it is lost 24 billions tons of topsoil worldwide (European Commission, 2012).

In southern Europe, 75% of the soils have an organic matter content under (3.4%) or very low (1.7%) of organic matter (Figure 1), amount that agronomists consider already as a pre-desert soil (Soliva & Felipó, 2002). When taking a look at the levels of organic carbon in the upper layer of the soil from the whole of Europe, there is 45% with content between 2 and 6% of organic carbon and another 45% of the area with values lower than 2% (Table 1).



Surface (Ha)	Organic Carbon (%)	Area (%)
66,558,238	< 1%	13
163,967,166	1-2%	32
232,325,106	2-6%	45
22,173,470	> 6%	5

Table 1.- Organic carbon content in European soils. (Source: Montanarella, 2002).

Figure 1.- Estimated content of organic carbon in the surface layers of soil in the South of Europe. (Source: Zdruliet al, 2004).

Even when it is difficult to give an economic value to this continuous land degradation, there are estimations from the EU for an annual cost around €38 billion (Source: Marmo, 2012)

A soil with poor content of organic matter will have the following properties affected: structure, higher tendency to quarter and compaction, accelerated erosion, increasing its temperature, decreased retention capacity of water and nutrients, fertility reduction, biodiversity and biological activity. (Soliva & Felipó, 2002). This highlights the important role of compost as an input of returning stabilized organic matter to the soil.

The key is the use of compost in the knowledge of its intrinsic characteristics and agronomic valorisation of organic matter with one goal: the increase in soil fertility (Sequi et al, 2000).

3 The effects of compost application to soils

When applying compost, it is important to not exceed the requirements of the plant or soil assimilative capacity rates, as this may present a risk of leaching or loss of nutrients (Easton & Petrovic, 2004; Vietor, et al 2002). Therefore, compost should be considered as more of a soil conditioner or improver rather than a fertilizer. Since the concentration of nutrients in the compost is comparatively low, with a slow release time, making the improvements in crop production will only be seen in subsequent years. In this way it is very difficult to assess the true agronomic value of applying compost, let alone trying to compare its potential to chemical-mineral fertilizers (Tittarelli & Canali, 2002; Shimozono et al, 2008). The presence of micronutrients and trace elements in the compost and their interaction with the availability of macronutrients and the crop's health and pest resistance, must be seriously considered in any comparison to mineral fertilization.

Figure 2.- The use of compost to growth different type of vegetables in healthy conditions is a common practice all over the world: left image, vegetable garden in Upper Galilee (Israel); right image, vegetable garden in Navarra (north of Spain).

Nevertheless there are some points about the nutrients required by the soils linked to the effect of compost application that must be taken into consideration:

* About Nitrogen (N). The organic forms of nitrogen that are in the compost will be released slower than mineral fertilizers which greatly benefit the soil, the plant and the environment. Nitrogen from mineral fertilizers could be easily released to the groundwater and/or to the atmosphere depending of their form (nitric or ammonia fertilizers) and the environmental conditions, causing contamination or euthropisation problems.
* About Phosphorus (P). The industrial production of most phosphorus mineral fertilizers comes from the transformation of rock phosphate into phosphoric acid. This process involves a high consumption of energy and acids, at a high economic cost. Moreover, the source of rock phosphate is limited in nature. Organic phosphorus in compost is protected from co-precipitation with the presence of calcium. Anyway doses application should be considered in certain areas by phosphorus rather than by nitrogen, especially in those regions where the continuous application of slurries and swine manures to the croplands may have altered the concentration of phosphorus in the soil.
* About Potassium (K). Usually there is not a lack of this macronutrient in the soils and the natural source is not limited like phosphorus. In some cases, when the crop has a high demand of potassium (banana for example) the soil needs an extra source. However in these particular crops, potassium is stored in some parts of the plant (leaves and stem). After a crop harvest, potassium could be returned to the soil if vegetal wastes are properly managed.

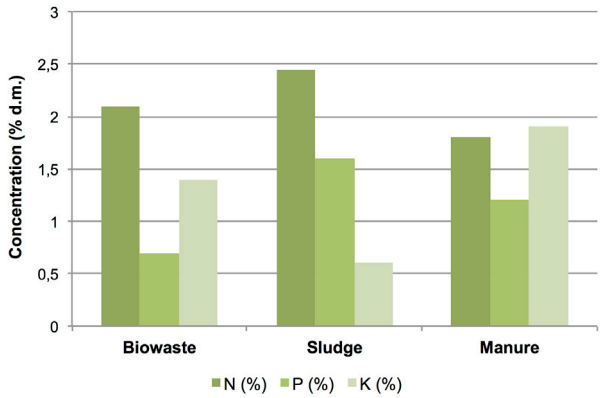


Figure 3.- -Concentrations of N, P and K in different kinds of compost (source: Huerta et al, 2006).

The evaluation of compost application to the soil cannot be done only by its agronomic effects in the short term, but also as an applied sustainable agricultural practice (Tittarelli & Canali, 2002). Among its benefits for the soil it is included (Golueke, 1982; Montanarella, 2002; Dorahyet al, 2006; Provinet al, 2007):

* Improving fertility, not only due to the contribution of N, P, S and trace elements, but it may also increase the pH in acid soils improving nutrient availability. This results in significant energy savings in the production of fertilizers.An application of 10 t·ha-1·year-1 of compost would save 160 to 1.340 kWh of energy that would be needed to produce the equivalent amount of 190 kg of nitrogen as fertilizer (Favoino, 2010). Compost has higher contents of organic matter than most of the organic materials that are traditionally use for land fertilization (Figure 4).
* Improving the structure, giving the soil a greater capacity for ventilation as well as a better drainage, improving ease of water collection and reducing irrigation requirements. Likewise, the continued annual application of compost, reduces the difficulties and costs of the soil work, with consequent energy saving.
* Improving the microbiota, and it can serve asa pest and plant diseases suppressor; including nematodes. This is both an environmental benefit in reducing overall pesticides use, and saves energy during production.
* Depending on the type of soil it can even act as a corrector of salinity and conductivity. A well-structured soil improves the infiltration of rain water and the permeability of a subsurface, washing the soluble salts (Avnimelech et al, 1994).
* Contributing to the sequestration of atmospheric carbon, acting as a carbon sink that along with good agricultural practices would also mitigate the greenhouse effect (Barral et al, 2001).

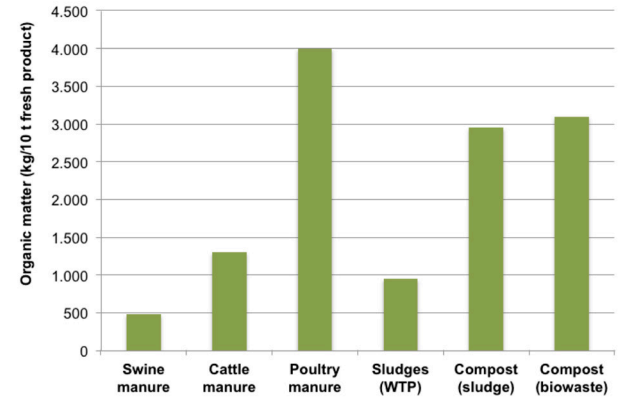


Figure 4.- Organic matter content of different organic materials (Source: MAGRAMA Spain, 2012. Adapted from Laboratory Applus Agroambiental's data, 2012). (WTP: Wastewater Treatment Plant)

Although there are many advantages to compost application, there exist some challenges when attempting to translate into economic values. The energy savings from compost application are linked to: work the land, mineral fertilizers production, pesticides production, water consumption, CO_2 sequestration; can be challenging to express in economical terms.

An approach could be done considering the prices of mineral fertilizers in terms of kg of nitrogen, phosphorus and potassium and knowing the composition of the compost in these macronutrients to estimate the equivalent cost. Nevertheless there are many other factors in the each area that can change the price, such as the availability of other sources of organic matter like manures or the levels of organic matter in the soils. Organic matter in soils is directly related to fertility, and if there is no other source apart from compost, this product will have an economic value much higher than its macronutrients content.

Another indirect advantage related to the use of compost is that it would contribute to the reduction of the amount of peat extracted every year for gardening purposes. Peat is a valuable, limited natural resource with high environmental impact from its extraction process and can only be found in certain regions. Its physical properties make it appropriate in the composition of substrates for gardening (professional and hobby), but the appropriate compost has these same properties and can be a perfect substitute.

The different benefits (direct and indirect) are summarized in Table 2.

Compost use	Soil Protection	Production/ energy savings	Sustainable use of resources	Fight against Climate change
Replacing the use of mineral fertilizers (N, P, K) and other amendments (CO_2 avoided, energy-saving and GHG)	✔	✔		✔
Recovery and contribution of organic matter and nutrients contained in the amendment	✔		✔	
"Sequestration" of carbon in soils	✔		✔	✔
Increasing biodiversity	✔			
Resilience (recovery capacity) of soils	✔		✔	
Reducing erosion	✔		✔	
Supporting biological activity -> prevention of "desertification"	✔		✔	
Slow release of nitrogen sources	✔		✔	
Improved working the land	✔	✔	✔	✔
Increased soil water retention	✔	✔	✔	
Substitution of pesticides	✔	✔	✔	
Replacing peat	✔	✔	✔	✔

Table 2.- Benefits of the correct biowaste management and compost use (Source: MAGRAMA Spain, 2012).

4 The meaning of "quality" for compost

The term "quality" is very often used to differentiate or promote a product and it is associated to its better characteristics, composition and/or durability compared to others. Whenreferring to compost, there are different concepts or forms to understand the term "quality" depending on the legislation, the interest of the final user and standards defined by different associations.

In last decades different countries, especially in Europe, began to define national standards for compost quality in order to guarantee the characteristics and properties of this product to the final users. There are more than just technical and scientific criteria in the definition of those standards. Political interests are also present and they mark the main differences between these standards.

Figure 5.- Physical aspect of the compost also has direct influence in its quality, even at a marketing level. Left, low quality compost; right, compost of high quality

So for each case, to really understand the technical and legal definition of the term "compost" is very important. There are many different definitions for compost, like the following:

- ✔ Organic amendment obtained from aerobic and thermophilic biological treatment of biodegradable waste collected separately from in-organic waste. The organic material obtained from the mechanical biological treatment plants for mixed waste will not be considered as compost, to be called bio-stabilized material. (Law 22/2011 of wastes and contaminated soils, Spain).
- ✔ Compost is the solid particulate material which has been sanitised and stabilised by a biological treatment process of which the last step is an aerobic composting process. Composting is a process of controlled decomposition of biodegradable materials under managed conditions, which are predominantly aerobic and which allow the development of temperatures suitable for thermophilic bacteria as a result of biologically produced heat. (End-of-waste criteria for biodegradable waste subjected to biological treatment, 2014).
- ✔ Solid particulate material that is the result of composting, that has been sanitised (see definition of sanitisation) and stabilised (see definition of stabilisation), and which confers beneficial effects when added to soil, is used as a component of a growing medium, or is used in another way in conjunction with plants. (Northern Ireland Environmental Agency).
- ✔ Sanitized and stabilized product obtained through aerobic biological decomposition (including thermophilic phase) under controlled conditions of biodegradable organic materials from Annex IV collected separately. (RD 506/2013 for Fertilizers Products, Spain).

Shared common points:

* reference to a biological aerobic process.
* must reach and complete the thermophilic stage.
* product must be sanitised for certain pathogens (Escherichiacoli, Salmonella, Chlostridium,...). It is perfectly possible if the thermophilic stage and the process conditions are adequately fulfilled.
* organic matter of the compost must be stabilized.
* commonly, there is a list of biodegradable organic materials that can be legally used to produce compost. For example,

only if the household biowaste comes from source separate collection it can be used to obtain a product named "compost". If the household biowaste is collected mixed with other non-organic fractions of urban waste, even if it completes the composting process, the final product cannot be legally named "compost", it is just a bio-stabilized product with restrictions for its application to the soil.

Not all composts are the same, as one of the most important and influential factors of compost quality is the raw organic material from which it is produced, and how the composting process takes place in the treatment facility. However, this concept of quality in compost, is inherently subjective, and linked to different types of pressures and interests. The intrinsic quality of compost would be given by their different properties and physical characteristics (particle size, water holding capacity, moisture, foreign particles, odour), chemical (content and stability of organic matter, mineralization speed of plant nutrients contained and the presence of inorganic and organic contaminants) and biological (presence of weed seeds, primary and secondary pathogens). There are also other relevant criteria for assessing the intrinsic quality of the compost such as: the destination of the product, environmental protection and market requirements (Soliva, 2000). The strategy to achieve a certain quality is inseparable from a comprehensive approach to waste management. It is unnecessary to put restrictive rules onproduction and quality of compost if other materials such as sludge from urban and industrial sewage treatment are applied in agriculture with amuch lower demand; or if no market for compost exists (Soliva, 2000).

4.1 Certified organic compost

It may be prudent for the facility to produce organic certified compost. Producing organic compost is demanded more both in the process conditions and in the raw materials. Some facilities just have a small production line for organic certified compost and the rest of the production is devoted to regular compost. But the good quality of this specific product gives also a good image to the other products that the facility sells.

In some countries where there are agencies that define and regulate the production and use of compost, it is normal to have quality or certification labels. These labels identify if the compost has been produced under adequate conditions, has been produced from authorized materials, and fulfils the requirements to be legally considered "compost" (Figure 6).

Figure 6.- Quality certified labels used in different countries for compost that have been confirmed by a certificate as appropriate by the independent organisms or associations. From left to right: European Compost Network, Austria, Italy, United Kingdom (Wales and England), Germany, United States.

There are national and regional organizations for ecological certifications with their own regulation and legislation, but at European level the following rules are in force:

* Council Regulation (EEC) No 2092/91 for organic farming
* COM Decision (EC) nº 64/2007 eco-label for growing media
* COM Decision (EC) nº 799/2006 eco-label for soil improvers

It is necessary to invest time, personnel and money during the first year or two years of the facility to create a network of customers surrounding the facility for selling the compost. Usually people will not come to the facility asking for compost and those consumers that may be interested need to know the product and its characteristics in order to take the decision of purchasing it or not. Other information like the speed at which the nutrients are released (specially the nitrogen) or the recommended doses for each culture are normally required.

5 The strategies for compost use

When applying compost to the soil, the purpose must be identified: as a source of organic matter or as a source of phytonutrients. It can be provided to improve the structure, characteristics and soil composition, through using stable and high in organic matter compost. In another application, nutrient composition of compost must be well known (mainly nitrogen), as along with its rate of mineralization. The importance of assessing the conditions of the soil and the needs of the specific crops that are going to be cultivated is also crucial.

Therefore there are three main strategic lines for compost marketing or delivery:

A. Selling to third parties

* **Professional use**

➢ Knowing and contacting potential customers in the area of influence of the facility and knowing their real needs. What kind of product do they need?, which characteristics/composition?, how the presentation should be (bagging, bulking,...)?, ...

➢ Studying the range of product/s that should be offered according to the needs of potential customers:

- ◊ Compost bulk or granular/pelletized.
- ◊ Packaged in bags (define volume) or in bulk.
- ◊ Minimum macronutrient composition (N, P, K).
- ◊ Defining the principal limiting parameters that the compost must fulfil and their maximum/minimum levels (conductivity, maturity/stability, NH4+, phytotoxicity ...).
- ◊ Possibility of adding other materials, substances or components to give the product certain desirable qualities for the client: sowing soil, organic fertilizer, nutritional supplement, etc ...

* **Agricultural use**

➢ Defining the needs of potential customers and define the type of product that the facility can and/or want to produce:

- ◊ Broadcast (topdress, incorporated).
- ◊ Plantation.
- ◊ Permaculture.

➢ Economical and technical analysis of the possibility of pelletized or granular products to increase their added value and marketability. Usually the equipment for fertilizer application is designed for spreading pelletized or granulated fertilizers, not powder materials like compost, so lots of farmers have problems or difficulties to apply compost in their croplands. They need specific machinery or contracting/renting the application service.

➢ Considerations in the application:

- ◊ Availability of specific equipment for application. The composting facility can provide that specific service to the customer for free or renting the machinery.
- ◊ Customer consulting (application doses, season for application, analyses of soil samples and interpretation...)
- ◊ Monitoring / customer support.

➢ Disposing of essay croplands where different crops of local species (or the most produced in the area) are cultivated using different doses of the compost and/or substrates produced.The potential customers can visit these parcels and get direct information of the results of using these products. This is especially important when the organic amendments and fertilizers are products in which generally only show their total or best benefits after three or five years of annual application. And usually crop soils have a surplus of certain macronutrients for the constant use of mineral fertilizers, so even if no fertilizer product is applied, the soil can have enough resources to produce a new crop in the following year.In those conditions is very difficult to distinguish the effects related to the applied compost within the first and second year.

➢ Considering the production of organic/ecologic certified compost or compost for organic farming. Usually there is a higher demand of certified compost, especially for organic farming, but also in professional gardening.

* **Forestry use**

Application systems/equipments and the technical way for compost application are extremely important to be considered for this potential use.

➢ Compost can be used as soil improver for new planting areas.

➢ Blending compost with soil to have a substrate for planting pits or applying compost as a surface mulch to suppress weeds during the development of the trees.

➢ Recovering the topsoil in forest areas that suffered from firewoods, reducing the loss of fertile soils because of erosion (mainly by water and rain).

➢ Creating substrates for seeding new trees in greenhouses.

B. Distribution to participants or users (if separate collection campaigns, regional or small-scale composting).

* **Domestic use for gardens and/or orchards**

➢ Knowing the characteristics and composition of the compost.

➢ Ensuring the sanitation and concentration of heavy metals in the compost that is dealt. In most local and national legislations the quality levels for compost are defined according to the concentration of heavy metals and in consequence their possible uses.

➢ Conducting education and outreach campaigns about the uses and applications of compost.

➢ Offering a volume of container / bagging doses suitable for handling by the final user.

➢ Advising on the dose and form of application according to the needs of the user.

C. Public/municipal use in gardening, landscaping and recovery of degraded areas.

This use is really important and has a significant economic impact as in general the public procurement reaches more than 15% of EU GDP (MAGRAMA, 2012).

* **Public gardens and green areas**

➢ Studying and defining which are the current needs of compost and/or organic amendments with the professional staff responsible for the care and maintenance of the green areas.

➢ Knowing the characteristics and composition of the compost or the product and which maximum levels must being fulfilled regarding certain limiting parameters: phytotoxicity, maturity, weed seeds, granulometry,...

➢ Studying the range of product/s that should be offered according to the needs of the specific uses.

➢ Offering a volume of container / bagging suitable for handling by the final user.

* **Recovery of degraded soils**

➢ Studying the quantities of compost that could be needed and which characteristics it should fulfil. Usually the demand of compost for this use is seasonal not continuous during the year.

➢ In most cases it is interesting to spread the compost with seeds to achieve a fast developing of vegetable cover. A green-compost, exclusive made of vegetal wastes, can be an interesting option.

➢ For this use compost does not need to have a high agronomic quality in consequence it does not have a high economic value.

6 The communication and awareness of costumers

First of all, it must be considered that the marketing of any product requires:

* Understanding requirements of the customers.
* Maintaining a quality control to ensure that product meets the specifications of the customers.
* Preparing the product to maximize its value.
* Presenting the product with a consistent positive image.
* Delivering the product in a timely manner; providing customer service.
* Pricing the product.
* Creating a trademark. It must be consistent with the use or final destination of the compost and not related to the origin of the "product", with the intention of occupying a highly competitive segment of the market.

Compost has some characteristics that make it completely different from any other products, a defined strategy to develop the marketing lines must be developed. Firstly, it must be considered that its production is continuous and is not based or directly conditioned by the market or customer demands.

The economic incomes of the facility, the revenues, are more important for the gate fees of the biowaste than for the compost sales. It must also be considered that the final composition and characteristics of the compost are highly influenced by the initial quality of the biowaste, so that maintaining the composition of the product along the time can be limiting.

There is a constant evolution of the compost if it is stored under non-adequate conditions. Even so there is a change of the product if it is stored for a long period of time, because the biological process of degradation and transformation of the organic matter continues, but at a very low rate.

Definition and knowledge of the market

As stated previously the main differences between compost types are in terms of quality (heavy metals content), nutrient content and other chemical parameters. It means that if there are different kinds of composts, there are different uses or applications for these composts. Different customers have different needs, and those needs will depend on how compost is going to be used.

There exists another important step of trying to understand the real needs of the customer by answering some initial questions:

* How is the compost going to be used?
* What are the specific project goals?
* What are the alternative product(s) available?
* How is the product going to be delivered and handled?
* When is the product needed?

In addition, economic savings of substituting certain inputs should be measured and disclosed. As it was mentioned, these saving can also depend on the other sources of organic matter that are available in the region. Either the compost already provides some of their components, or because the increase of organic matter in the soil favors the saving of watering, reduces the energy consumption of the mechanical work or promotes the fight against certain types of phytopathologies.

The compost requirements for nursery and greenhouse cultures demand higher quality composts (maturity or stability, low salts content, macronutrients) and a high price can be obtained. This also means that those customers will require a stable quality along the time.

Table 3.-Compost feedstock and its acceptance within selected compost markets. MSW: Municipal Solid Waste; SSHB: Source Separated Household Biowaste. (Source: Alexander, 2012).

Kind of compost	Use				
	Landscapers	General turf	Sports turf	Topsoil manufacturing	Agriculture
Yard trimmings	✔ ✔ ✔	✔ ✔ ✔	✔ ✔	✔ ✔ ✔	✔ ✔
Biosolids	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Manure	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
MSW	✔ ✔		✔	✔ ✔	✔ ✔
SSHB	✔ ✔ ✔		✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔

Kind of compost	Use			
	Erosion/Sediment control	Reclamation	Resellers	Wholesale nurseries
Yard trimmings	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Biosolids	✔ ✔	✔ ✔ ✔	✔ ✔	✔ ✔ ✔
Manure	✔ ✔	✔ ✔ ✔	✔ ✔	✔ ✔ ✔
MSW	✔	✔ ✔ ✔	✔	✔ ✔
SSHB	✔✔ ✔	✔ ✔ ✔	✔ ✔	✔ ✔

Presentation of the product: bulking or bagging?

The main differences between bulking and bagging of the compost are related to the type of market where the compost will be sold. It is supposed that the home gardener market gets higher prices for the compost, but it means higher investments in the facility for bagging (sieve, packaging,...).This requires the facility to take close care of the compost in order to achieve the conditions required for bagging (maturity, moisture, particle size,...). All these needs will increase the production costs in the facility.

The sales of bulking compost means lower prices, but it also entails lower costs of production if the work protocol in the facility is adequate and is well defined when attending to the biowaste characteristics, the environment and the composting system. Farmers and professional gardeners are the main customers for this compost presentation, but also there is demand for public works, sport fields, wetlands, etc...

Production and demand of compost

A frequent occurring challenge in the marketing of compost produced by a facility after the first years, is to get a balance between the production of compost and its quality and characteristics. If the product quality is good, it will have more customers, but there is also the risk that the producer could try to increase the quantity of compost sold by introducing it to the market as unfinished compost. There are associated risks if the customer has any problem with the compost because it is not yet completed and this will reduce or close the future sales of the compost produced in that facility in the following years.

It will be necessary for the customer to have a guarantee of the quality of the product.

Figure 7.- Compost to be sold by bulking (down) or by bagging (up).

Information and labeling

Customers want to know the characteristics of the product and usually demand information regarding certain parameters like:

* Nutrients content, especially nitrogen (and its chemical forms), potassium and phosphorus.
* Soluble salts or conductivity, that will limited the uses of the product,
* pH
* Doses of application to their crop fields.
* Methods and/or machinery for the application.
* Pathogens, because it must be sanitized for certain microorganisms (Salmonella, Escherichiacoli, Clostridium,...)
* Weed seeds, because they must not be present in the compost.
* Heavy metals content, according to the national legislation
* Origin and/or kind of biowastes used in the process of production. That is to have a traceability of the product and its raw materials (biowastes). It should be noted that the composts that could be eco-labeled and certified have a high demand for organic farming and usually command higher prices.

In order to retrieve this information, chemical analytics are not the only requirement. It is also recommended to develop studies of germination and fertilization of different kind of plants with the product. Some kind of link or relationship with a research center or university to develop on field tests, maybe in some crops of local farms, will be an important experience to get information of the product, and to obtain physical results to reveal to potential customers.

Labelling is an important aspect within any marketing strategy, so its consideration for compost sales is critical. In many countries it is regulated the minimum information that any fertilizer product and/or compost must show within the labels: source materials, nutrient contents, heavy metals concentration, etc.
When the product is targeted to professional gardening or agriculture use there is other information that some customers desire; such as at what rate is the nitrogen liberation is at, the main forms of organic nutrients, and the recommended doses for the different applications.
Utilizing a webpage with all the extra information which does not have place in a label, is a great way to promote the product both locally and within other regions.

Creation of a compost market

When analyzing the compost market through means of investing time, staff and money, we can predict the potential customers influenced with the area around the facility. It will be critical to understand our customer base by learning what they need, what products they are using as fertilizers, pesticides and/or soil conditioner, and the prices that they are currently paying, etc...

Only with this information it will be possible to create a marketing plan, to establish real objectives and define the needs and efforts to achieve such goals (staff, time and budget). In at least from two to three years it is recommended preparing a customer database and comparing the results of the product with its competitors.

The operators of the facility should consider that they are able to create other products apart from compost, like compost tea or vermicompost, as well as the compost can be presented as pellets or granules to make easier and more efficient to be spread onto crop fields.

It is certain that the main current and future fate of the compost is the agriculture. For this scope of action, the material can enter into the nutritional market as a "product with organic value", as a "product with nutritional value" or as a "product with organic-nutritional value". In some cases to improve the possibilities of commercialization, it will be prudent to improve the nutrient quality of the compost adding mineral elements (urea, phosphorus...) to satisfy the requirements that certain cultures, customers or the close market could demand.

Customer service

The sale of the compost to the customer should not mean the end of the relationship with him. A post sale support about how to use it, how to spread it, the recommended doses, the season to be applied, etc... can be provided to be sure that the product is rightly used and the customer obtain all its benefits.

Even in some cases it can be interesting to have a conveyor spreader to give the service or to be rented by the farmers for compost application on the crop fields.

Education

Not only with the scope of extend the customer base it could be interesting to promote and divulge among the closer cities, towns and/or villages, information about what composting is, how really the biological process works, its possibilities, the importance of soil fertility and its relationship with the organic matter content.This kind of information in the form of presentations (educational centers, associations, farmer cooperatives,...), reports in local media, organizing visits to the composting facility,.... These activities would not be difficult to be organized and will report, at a medium term, good reputation to the facility and that could be well known.

Annex I –Different considerations for compost marketing depending of the application range.

Application range	Application	Recommendations	Risks/problems
Farming	Plantation	• Ensure product characteristics (maturity / stability, conductivity, particle size, phytotoxicity, texture). • Present a format suitable for selling to the customer (packaging volume).	• Not maintaining quality/characteristics/ composition of the product during the time.
	Broadcast (topdress, incorporated)	• Offer the service for land application of compost or rent the specific machinery. • Compost maturity suitable for the crop. • Customer technical support (dose, method of application...). • Study the technical and economic feasibility of pelletized or granular product.	• Presence of improper materials (plastics, glass, metals) in the compost. • Do not maintain product quality annually. • Incorrect application on croplands (not homogeneous).
	Permaculture	• Present a format suitable for selling to the customer (packaging volume). • Ensure consistency in the composition and characteristics of the lots of compost produced. • Assistance to clients in terms of dose applied and product features.	• Compost overactive / immature, generating condensation, odour or alter the package. • Presence of improper materials (plastics, glass, metals) in the compost. • Do not maintain product quality annually.

Professional	Horticulture and floriculture	• Ensure product characteristics (maturity/stability, conductivity, particle size, phytotoxicity, texture). • Ensure consistency in the quality of batches of compost produced. • Study the possibilities of mixing the compost with other materials (sand, soil, nutrients, ...) to develop specific substrates. • Adapt the type of product to customer needs (substrate, fertilizer, organic amendment).	• Lack of maturity/stability of compost. • Phytoxicity of the product. • Presence of improper materials (plastics, glass, metals) in the compost. • Do not maintain product quality annually.
	Recovery of degraded soils	• Know the characteristics of the product and the area (soil) where it is going to be applied. • Offer professional advice regarding dosage and application forms. • Have specific machinery for product application. • Green-compost may be interesting for fast developing of vegetation cover on the area.	• Presence of improper materials (plastics, glass, metals) in the compost. • Incorrect application on croplands (not homogeneous).
Domestic	Gardens, orchards	• Present a format suitable for selling to the customer (packaging volume). • Ensure consistency in the composition and characteristics of the lots of compost produced. • Assistance to clients in terms of dose applied and product features. • Clear and comprehensive labelling.	• Compost overactive / immature, generating condensation, odour or alteration of the package. • Phytoxicity of the product. • Presence of improper materials (plastics, glass, metals) in the compost. • Do not maintain product quality annually.

To know more:

http://compost.css.cornell.edu/Brinton.pdf

http://www.qualitycompost.org.uk/upload/cqp_2012.pdf

http://www.compost.it/attachments/article/903/MR03_ENG_Compost_CIC.pdf

http://www.compost.it/use-of-compost-english-version-84.html

http://www.compost.org/CQA-En.html

http://ec.europa.eu/environment/waste/compost/pdf/hm_annex2.pdf

http://compostingcouncil.org/wp/wp-content/plugins/wp-pdfupload/pdf/5620/Compost%20Uses%20&%20Markets%20by%20Al%20Rattie.pdf

http://www.organicstream.org/category/the-organic-stream/

Annex II–European directives concerning the compost quality

		Organic farming	End-of-Waste	EU ECO Label	Stabilised Biowaste		
LEGAL BASIS OR STANDARD		Council Regulation (EEC) No 2092/91	End-of-waste criteria on Biodegradable waste subject to biological treatment	COM Decision (EC) nº 64/2007 eco-label to growing media; COM Decision (EC) nº 799/2006 eco-label to soil improvers	Sewage Sludge Directive		
POTENTIAL TOXICS ELEMENTS (PTEs) CONCENTRATIONS (mg·kg-1 d. m.)	Quality / Standard			Voluntary (Mo: 2; Se: 1,5; F: 200 if industrial processes are included)	Compost/ digestate Class 1	Compost/ digestate Class 2	Stabilised biowaste
	As	-	-	10	-	-	-
	Cd	0,7	1,5	1	0,7	1,5	5
	Cr (tot)	70	100	100	100	150	600
	Cr VI	0	-	-	-	-	-
	Cu	70	200	100	100	150	600
	Hg	0,4	1	1	0,5	1	5
	Ni	25	50	50	50	75	150
	Pb	45	120	100	100	150	500
	Zn	200	600	300	200	400	1500

		Organic farming	End-of-Waste	EU ECO Label	Stabilised Biowaste		
PERSISTENS ORGANIC POLLUTANTS CONCENTRATIONS (mg·kg-1 d. m.)	Total PAH		< 6		3		
	Total PCB				0,4		
IMPURITIES	Total (> 2 mm fraction)		< 0,5%		< 0,5%	< 0,5%	< 3%
	Total (> 5 mm fraction)				< 5%	< 5%	-
QUALITY REQUIREMENTS	Organic matter		> 15%				
SANITISATION MICROBIAL INDICATORS	Salmonella sp.		absents in 25 g				
	Escherichia coli		< 1000 CFU/g	< 100 MPN/g			
	Others			Helminth Ova			
OTHER ASPECTS	Weeds (plants·L-1)		≤ 2	≤ 2			
	Stability Maturity		Rottegrade III / OUR < 25 mmol O2·kg-1 VS·h-1				

Annex III - Statutory regulations concerning the compost quality

COUNTRY	LEGAL BASIS OR STANDARD
Austria	Compost Ordinance BGB1. I 291/2001
Belgium	Flanders: VLAREA Flemish Regulation on waste prevention and management (B.S. 1998-04-16) Wallonia: Decree on compost and digestates (in revision)
Canada	Production and Use of Compost Regulation CCME Guidelines for Compost Quality Others
Czech Republic	Act on fertilisers 156/1998 Sb. By the Public Ministry of Agriculture CSN 46 5735 Prumyslovékomposty Czech Compost Standard
Denmark	Stat. Order 1650 of 13.12.06 on the use of waste (and sludge) on agriculture; Compost after 13 Dec. 2006
Germany	Fertiliser Ordinance (26. November 2003) Closed Substance Cycle and Waste Management Act (KrW-/AbfG) Biowaste Ordinance (BioAbfV, 1998) RAL Gütesicherung RALGZ 251
Estonia	Env. Ministry Re. (2002.30.12; nº 87) and Environmental Ministry regulation 2002.01.01 nº 269
Finland	Jätelaki (Waste Act) Fertiliser Product Act 539/2006 Decree of the Ministry of Agriculture and Forestry on Fertiliser Products 12/07

France	NFU 44 051 Standard NFU 44 095
Greece	Common Ministerial Decision 114218, 1016/B/17-11-97 Fertiliser law (Law 2326/27-6-1995, regulating the types of licenses for selling fertilisers)
Hungary	Annex No. 2 to Decree 36/2006 (18. 05) FVM of the Minister of Agriculture and Rural Development Quality Specification for the Crop Yield Increasing Materials
Ireland	EPA Waste license or Local Authority waste permit
Italy	L. 748/84 (law on fertilisers) D.M. 05/02/98 (Technical Regulation on simplified authorization procedures for waste recovery)
Lithuania	Decree of the Ministry for Environment (D1-57/Jan 2007)
Luxembourg	Licensing for plants / Waste licenses
Latvia	Licensing as organic fertilizer (Cabinet Regulation Nº 530 "Regulations on identification, quality, conformity and sale of fertilisers" 25-06-2006)
Netherlands	NFU 4 Fertiliser act (2008) 4 051 Standard
Poland	Fertiliser law
Portugal	NP 1048 – Standard for fertilisers Portaria 672002 pg 436
Sweden	Private QAS and SPRC 152 (compost standard)

Slovenia	Decree on the treatment of biodegradable waste (Official Gazette of the Republic of Slovenia, nº 62/08)
Slovak Republic	Act. Nº223/2001 Col. on waste as attended Slovak technical Standard (STS) 46 57 35 Industry composts Act. Nº136/2000 Col. on fertilisers Act. Nº264/1999 Col. about technical requests for products Regulation of the Government Nº400/1999 Col. which lay down details about technically requirements for products
Spain	Real Decree 506/2013 on Fertilisers Products Order PRE/630/2011
South Africa	National Environment Management: Waste act, 2008 (Act nº 59 of 2008). Draft National Norms and standards for organic waste composting
United Kingdom	Licensing for plants Waste Management Licensing Regulations Animal By-Products Regulations BSI PAS 100:2011 BSI PAS 100:2005 + Quality Compost Protocol / Waste licenses

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