

COMPOST AS A PRODUCT AND ITS MARKET

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1. ABSTRACT

At present, approximately 10 million tonnes out of the total biowaste that could potentially be recovered are composted in homes or processed through selective collection and later treatment, giving an approximate production of 5.5 million tonnes of compost in the EU as a whole.

In order to encourage the use of this product, it is necessary to create a much more consolidated market in which compost is seen as not as a hard to eliminate waste problem but as a quality product with numerous applications and, therefore, a wide range of commercial outlets.

This article analyzes the strengths and weaknesses of compost as a quality product, the traditional and more innovative outlets, its main competitors and barriers. In addition, at the same time as it studies the current situation and the future prospects of the compost market, it also highlights the importance, when it comes to fostering this market, of developing a Community Directive and creating associations of compost consumers and producers that can work to ensure the production and distribution of a high-quality product.

Establishing quality standards within the scope of the European Union is an essential measure to ensure and harmonize the quality of compost as a product, to generate a climate of confidence among consumers and, of course, to encourage the development of the compost market.

2. INTRODUCTION

Generally speaking, it can be said that a market exists when the necessary conditions are present for buyers and sellers of a good or service to establish communication with each other in order to carry out transactions. Normally the existence of a market implies that transactions are carried out on the basis of a certain degree of continuity.

A market with perfect competition expresses the idea of the presence of a large number of companies freely entering or leaving the marketplace and using prices as given variables, since no perceptible influence is exercised on market values since everyone is offering small amounts of product.

For a market to be in a state of perfect competition, the conditions which must be met are as follows:

1. Atomicity of the market: There must be a large number of buyers and sellers so that the amounts bought or sold by each economic agent are insignificant with respect to the total of the transactions effected.
2. Homogeneity of the product: All of the units of the goods in question must be identical, with no differences in quality or presentation.
3. Perfect information: Buyers and sellers must be aware of all the prices on the market, that is to say the market must be transparent.
4. Free access to the market: For parties offering and looking for goods, without any legal or de facto obstacles for doing so.
5. Total mobility: Of the production factors.

With regard to compost, it could be said that there is no market in the strict sense but merely a number of transactions.

Furthermore, the sale price of compost is not defined by the allocation of its costs, but by the prices of competitive products, which are all low. The quality of the compost is of fundamental importance in order to achieve a good degree of acceptance by its potential consumers and this also constrains the sale price and the variety of uses to which compost is put. The greater the quality, the greater the acceptance, the higher the prices, and the more varied its uses. Hence it is extremely important that there should be a good system of selective collection at source.

A significant part of the revenue will come from the collection of the tariff corresponding to waste management and not merely from the sale of the product.

3. COMPOST AS A PRODUCT

The issue still pending in the compost sector in Europe is the establishment of a structure allowing its sale. For compost to become the object of commercial transactions, it must comply with certain specific, stable and well-defined characteristics capable of giving it the consideration of product for which there could be a level of demand defined in terms of competition with others. This competition comes from products derived from peat, tree bark, humus, dung, with considerable experience in the marketplace, user familiarity with the product and a well-established sales structure. This competition implies a driving force motivating the associations of composting firms to define their product and find a niche in the market.

There are numerous opportunities for using compost. It has traditionally been used as a soil additive for balance and repair, as a fertilizer, etc. The various certified qualities allow greater diversification of its usage. Those market sectors that have used compost in the traditional manner include:

- a. Agriculture, as a protective element against erosion and as a soil improver
- b. Fruit production, vine-growing and other long-term crops, as a nutritional supplement.
- c. Market gardening (vegetables, ornamental and perennial plants, nursery gardens, private gardens) as a soil improver.
- d. Forestry (especially for nursery gardens and transplanting of conifers) as a soil improver.

Other more innovative uses in these same market sectors or in other sectors include:

- a. Domestic gardening as a substrate for pot plants, roof gardens and soil for cemeteries
- b. Civil engineering, for the closing of landfills, acoustic barriers and levelling of infrastructures (roads, industrial complexes, buildings)
- c. Environmental industry as biological filters, to absorb unpleasant smells at sewage plants, industrial installations and leachate tanks or for the cleaning of polluted land, as a soil improver
- d. Landscaping, parks and public areas, as a substrate, structural stabilizer and as a soil improver and regenerator. Within this category, compost is used for building leisure and recreational facilities such as golf courses, for stabilizing embankments, protecting dikes, reinforcing lakeside shores, etc.
- e. In wine production and fruit growing, as support for seedlings
- f. Market gardening, in nursery gardens, vegetable production and ornamental plants, as a substrate and support for sowing.

The destination of compost will depend on the market needs in the area. There are cases of eminently rural areas where over 60% of the compost is used in agriculture. Nonetheless, in densely populated areas, with intense landscaping activity, only 20% of the compost will be used in agriculture. The composting plants in large cities have to make a much greater sales effort than those located in areas less densely populated, since the greater market diversification in urban areas implies a greater dispersion of resources.

The area of influence for the sale of compost from a specific plant depends on the product's sale price at the plant. If this is low (6 €/tonne), the radius of influence may be as much as 150 Km, whereas higher sales prices shorten this distance to only 50 Km in some of the Länder in Germany. Other factors affecting this area of influence are the amount to be used and the intended use of the compost. An application in greenhouses allows greater distances than its use with other types of crop.

There are various barriers affecting the demand for compost, its use and sale, its economy and the development of new markets. The most noteworthy among these barriers are:

- The external costs associated with the use of compost and its competitor products
- Negative image of compost
- Possible presence of pollutants in the compost
- Legislation and standards issues
- Issues with the structure of the market itself

Society has a very negative view of compost because it is seen as a waste-derived product and has historically been of poor quality. This barrier must be overcome by using quality control and assurance techniques for the compost as well as environmental awareness, so as to turn this problem into an advantage, as has happened in Germany, Austria, Denmark, the Netherlands and the Belgian region of Flanders, where compost has a more positive image as well as being certified as a quality product and an environmentally satisfactory solution to the problem of waste management.

A much more consolidated market is being created around compost in these countries than in the rest of Europe, and compost is no longer seen there as a waste which it is difficult to place on the market but rather as a product with numerous applications and, therefore, numerous commercial outlets. All of this has been possible thanks to the development of legislation tending to foster this market and thanks to the creation of associations bringing together producers and consumers of compost to work together in order to ensure the creation and distribution of a high-quality product.

Mistrust among consumers comes about through a lack of information among the general public about the product's applications, quality, advantages, etc. One way of overcoming this barrier is through the creation of composting associations as these have a very important role when it comes to defining product standards, granting quality certificates, specifying the composition and usage recommendations on labelling, as well as product promotion. On the one hand, these associations are already operating in some EU countries and, on the other hand, the second version of the working document for the Draft Directive proposes labelling for compost and the information this labelling must contain.

It is possible to solve compost's reputation as containing pollutants and impurities, which hinders its sale or application and, in many cases, prevents it from being considered as a useable product. The establishment of suitable systems for the selective collection of waste so as to ensure pollutant-free raw materials. In fact, the working document for the Draft Directive makes this selective collection compulsory.

The lack of legislation establishing the necessary criteria to ensure quality compost is another of the obstacles to the commercial success of this product. With the future Directive, steps will begin to be taken to eliminate this barrier.

4. THE IMPORTANCE OF PRODUCT QUALITY

The savings in raw materials and energy, as well as the capacity to generate jobs, are the key hallmarks of the systems for exploiting the materials contained in waste streams. Nonetheless, we must not overlook its capacity to become a factor for social progress, optimising elements such as the quality of public services, consumer participation and social cohesion.

The favourable attitude of the Public Administrations and the citizenry of Europe towards composting may, however, be no more than hot air if measures are not adopted to promote and ensure its competitiveness. In this sense, there are two key factors: compost quality and the opening-up of markets.

Creating a European market that facilitates the competitiveness of compost requires more demanding and harmonized regulations throughout Europe in order to limit the imbalances between territories and promote an economic activity that can maximize its potential.

To make compost competitive, therefore, European policy on this issue requires a series of legal, economic instruments and promotional measures.

Several economic instruments used in Europe must now be made more widespread and harmonized. First of all, the feasibility of composting depends to a large extent on its competitive price vis-à-vis other alternative treatments. With cheap landfills, the percentages of composted waste will necessarily remain low. As a result, it is vital for all Member States to respect and enforce strictly the requirements of the European Directive on landfilling of waste, and a tax must also be instituted on landfilling and other disposal systems to take into account their environmental impact and thus make the use of these options less attractive.

The need to increase and assure the quality of compost as a product is closely tied to the efficient development of selective collection systems. These systems cannot be an end in themselves but must be seen as a direct consequence of the waste streams to be generated in line with the different goals proposed. Thus, it is absurd to attempt to achieve quality compost without first preparing a waste collection stream for organic waste.

With regard to this latter point, it is impossible to promote the full exploitation of biowaste without a Directive that harmonizes and defines the procedures and quality of the compost produced.

Another of the challenges, perhaps the most important of all, is the standardization of compost products so as to foster a framework of confidence around these and facilitate their emergence onto the market. In addition, it is essential to establish regulations for the waste selected and the compost obtained, thus encouraging market transparency and the transactions between buyers and sellers.

Finally, special attention must be paid to promotional measures. These include the creation of a European labelling system identifying compost products or the establishment of positive discrimination criteria in their favour.

In this sense, work is currently under way on both the working papers prior to the Draft Directive and also the national legislations of the EU Member States which have advanced furthest in these matters. So far, and in order to assure product quality, the following parameters have been stipulated for the different stages of the process:

- Identification of the waste streams that must be collected selectively and the source of the waste that can be used for composting.
- Establishment of the requirements to be met by the process in order to ensure appropriate conditions of hygiene in the final compost.
- Definition of the standards for the end product, in terms of its content in heavy metals, pollutants, impurities, gravel and grit, as well as the hygiene requirements (absence of pathogens and minimal presence of fertile seeds), so as to assure its quality.
- Determination of the various limits for these standards with regard to the different quality categories for compost.
- Specification of the different uses and the limits on the application of compost in terms of the different categories stipulated.
- Determination of parameters, frequency and methodology of the analyses to be carried out on compost.
- Requirement of the creation of a label identifying the various quality factors and product composition in order to provide additional guarantees to users.
- Fostering of promotional measures, particularly the empowerment of quality associations linked with compost producers.
- Establishment of limits for organic pollutants, such as the presence of dioxins, with regard to the different uses of compost.

5. USE OF COMPOST IN MARKET-LEADING COUNTRIES

In **Germany**, almost half of the compost is used in agriculture, with other uses being mainly landscaping, market gardening and domestic gardening.

In **Austria**, the outlets for compost have been local until very recently, as 60% of all compost was produced on the farms themselves. Nowadays, the installation of large composting plants is redressing this balance. One third of the total is used in agriculture. Other uses of importance are landscaping and domestic gardening, basically as a soil improver or to enhance soil mixtures. It is also applied for the creation of humus and restoration of mountainsides in the Alps.

In **Denmark**, half of the compost is used by private consumers, where the citizens themselves participate in the production cycle. Another important amount is used in public parks and greens, farms and nursery gardens, with some more marginal use in agriculture. A more recent use is as a covering for closed landfills.

In the **Netherlands**, the compost is intended mainly for agriculture, fruit and vegetable production, landscaping and domestic gardening. These sectors account pretty evenly for 90% of production. The remainder is for municipal uses, soil recovery and covering of landfills. In the last ten years, compost production has increased by 15%.

In **Flanders**, compost is used in the following applications: landscaping, soil-related industries, substrates and domestic gardening. Agriculture and market gardening represent a marginal use of compost. Other uses introduced more recently are de-contamination projects, biotechnology (at a testimonial level) and export. One fifth of the compost is used by private individuals.

6. ECONOMIC IMPLICATIONS OF LARGE-SCALE COMPOSTING

The **costs** associated with compost production can be divided into:

- Costs of selective collection at source: Special containers, lorries, collection routes, etc.
- Investment costs: Intended for building of the plant and its commissioning.
- Plant operation costs: Normal operation of a plant at full capacity.
- Costs derived from quality maintenance: Analyses, monitoring, certificates, etc.

- Sales costs: Marketing, advertising campaigns, sales promotion, human resources for sales and public relations.
- Distribution costs: Transport of compost. These are usually passed on to the client.

If composting is seen as one of the treatment options within a waste management system, its costs must be passed on to citizens through municipal charges. The revenue obtained through the sale of compost will be used to reduce the amount of these charges, as happens with the sale of electricity in other waste treatment options.

Until recently, the disposal option most commonly used was landfill. The demands of the Directive with regard to landfilling, particularly the limitation of the amount of organic matter reaching landfill sites, makes it necessary to use other treatment options first (such as mechanical-biological processing). This requirement makes landfilling more expensive, thus making composting costs relatively more attractive, particularly when landfilling is subject to specific levies.

The proposal in the working document for the Draft Directive is to introduce a system for the selective collection of biowaste where none is yet available within the term of three years for large cities and five years for small towns, following approval of the Directive. During the introductory phase of the selective collection, these costs will be increased due to the need to acquire new containers, vehicles, etc. According to different studies carried out in various countries in Europe, this increase in costs varies between 35% and 50%, depending on multiple factors such as collection frequency, the type and distribution of the housing receiving this service (houses, blocks of flats, ...), etc. In the Netherlands, where collection is weekly, the costs of selective collection and transportation amount to 45 € per tonne for blocks of flats and 80 € per tonne for houses.

The quality requisites associated with compost production also imply a series of costs for the producer. The costs derived from quality maintenance can be broken down into the membership fees paid by the composting firms to the corresponding associations (almost 1,000 € plus a sum per tonne which is not usually more than 0.5 €), the expenses of taking samples and product analyses (with an order of magnitude that varies between 3,000 and 10,000 €/year).

The costs derived from the compost sales strategy depend on objective and subjective factors. The objective ones (human resources, labelling, ...) are relatively easy to estimate. The subjective ones (advertising campaigns, public relations, sales promotion) vary according to personal decisions by the person in charge of sales and the production company itself.

As the compost's **sale price** is established in terms of the price of the products with which it competes (humus, soil correctors, etc.), its price is normally very low. In addition to the price of the products competing with compost, its price will also be determined by the amount of each transaction and its presentation:

- In the market-leading countries, for the case of bulk-sold agricultural uses, this price varies between 0 and 15 €/tonne.
- Compost intended for horticulture and landscaping in Germany and the Netherlands, duly packaged and labelled, is sold to small-scale consumers in small packs at a price that can reach 70 €/tonne.
- Compost for the recovery of former landfill sites is zero-priced.

The average price of compost in these countries is approximately 25 €/tonne.

Another economic factor to be taken into account is the **export** of compost. This occurs in some of the market-leading countries (especially in Flanders and the Netherlands) to regions in adjoining countries. Nonetheless, these compost exports are currently constrained by the different quality criteria in force in different countries, as well as transport costs.

The unification of quality criteria proposed in the Biowaste Directive working papers solves the problems of differing quality categories, although not those of distance.

7. CURRENT MARKET SITUATION IN THE LEADING COUNTRIES

In 1998, **Germany** sold its entire annual production of between 2 and 2.5 million tonnes of compost. The compost sold for agricultural uses has the lowest price. Export of compost from Germany is merely testimonial.

In **Austria**, compost production in 1997 amounted to 500,000 tonnes, all of which is used within its own borders. The greatest demand is for the highest quality bulk compost.

In **Denmark**, 180,000 tonnes of compost were sold in 1995, of which almost all (99%) was bulk and only 1% was packaged for consumption by private individuals. Most of the bulk compost was used in domestic gardening, landscaping, soils and agriculture.

In 1997, the **Netherlands** sold its entire annual production of compost derived from food waste and is currently selling off its surplus stocks from previous years. The strongest markets are for compost as substrate and as a means to prevent the formation of dust in various crop types. Landscaping in general and the growth of ornamental plants are demanding more and more high-quality product. Agriculture continues to be one source of demand, although at very low prices. These vary depending on the amount to be purchased and the time required to prepare the order.

In **Flanders**, 200,000 tonnes of compost were sold in 1998. Five years earlier, only 50,000 tonnes of this product had found a buyer; since then, the pace of growth has continued. To prevent compost becoming a seasonal product, producers are tending towards a more diversified market. The sale price, however, has stayed low for a long time because of greater production levels, increased competition with other products and under-developed sales infrastructure. Although there have been no regular imports of compost, Flanders imported 20,000 tonnes from the Netherlands in 1995. In addition, Flanders exports compost to France.

8. FUTURE MARKET PROSPECTS

Table 1 compares compost production in the different EU Member States in 1998 with the potential production of compost in these countries. This hypothetical maximum amount of compost can be considered asymptotic as it will evidently never be possible to collect 100% of the organic matter produced using selective collection. The table also indicates the amount of compost that could be consumed in each of the Member States if it were used on 6% of the arable surface area. This hypothesis is extremely conservative as it does not take into account any use of compost other than the traditional ones and stipulates a very reasonable estimate for agricultural use. This figure is obtained by multiplying 6% of the total surface area of arable land by the amount of 30 tonnes of compost applied per hectare over three years, the application measure suggested in the working document of the Draft Directive, for type 2 compost.

Analyzing the table, it can be deduced that there is excess capacity in the markets of the Member States to assume the entire amount of the potential compost production in each one so this factor does not limit the market development for compost as a product.

Member State	Current Production (millions of tonnes per year)	Potential production (millions of tonnes per year)	Capacity for agricultural use of compost (6% arable land, millions of tonnes per year)
Market-leading countries			
Germany	2.4	4.50	7.10
Austria	0.50	1.00	0.90
Belgium	0.20	0.75	0.42
Denmark	0.25	0.50	1.50
Netherlands	0.65	0.75	0.54
Sub-total	4.05 (75%)	7.50 (25%)	10.46
Rest of EU			
Spain	0.45 ¹	3.50	9.54
Finland	0.03	0.40	1.50
France	0.24	7.00	10.77
Greece	0.01 ¹	0.80	1.78
Ireland	0 ^{x.1}	0.20	0.60
Italy	0.25	5.00	6.00
Luxembourg	0.003	0.025	0.035
Portugal	0.10 ¹	0.60	1.80

United Kingdom	0.16	4.60	4.18
Sweden	0.10	0.80	1.78
Sub-total	1.35 (25%)	22,925 (75%)	37,985
Total	5.40 (100%)	30,425 (100%)	48,445

Table 1. Current and potential compost production

X In reality, the figure for Ireland is 10 tonnes

1 In the cases of Spain, Greece, Ireland and Portugal, a quality product is obtained from the bulk waste stream, amounting to 3,013,000 tonnes/year of raw material input for Spain.

2 In the cases of Luxembourg and Ireland, current production is lower than in other EU countries at 0.06 and 0.0002%, respectively.

Potential production in the European Union amounts to about 30 million tonnes, corresponding to about 60 million tonnes of biowaste to be processed.

Table 2 presents the possible competitors on the market, the type of clients and the prices that can be achieved by compost for various uses. These can be classified as soil improvement for vegetable crops on the one hand and soil adaptation on the other.

In the first case, compost provides a series of properties favouring the growth of plants and agricultural produce. The properties of land tend to become degraded through intensive use over time and so need to be regenerated. In the long term, compost could offer medium to high economic yield, as it would improve the soil's suitability for crop use and so increase its efficiency. The clients in this group are individuals or private companies.

In the second case, soil adaptation, the use of compost is usually a one-off event. The long term economic yield is almost zero as there is no exploitation of the compost's properties as a soil improver. The clients for this second group are usually publicly-funded institutions.

The main competitors of compost for the crop market are peat and organic fertilizers. To prevent a price war with these products, in Germany, Austria and the Netherlands, compost is mixed with some of these to achieve a high quality product with the positive features of the various products. The second draft of the future Directive also considers this possibility.

The potential for using compost in Mediterranean countries is very high, due to the nature of the soils and the large extension of agricultural land. Compost could be used to prevent erosion, excess salinity and organic depletion of soils, as its use improves stability, porosity, water and nutrient absorption capacity, so raising its organic load. In this way it could be an effective tool against desertization. According to Table 1, however, there is a large difference between the amount of compost produced and the potential production capacity.

Output	Financial Yield	Competitors	Type of client	Achievable Price (€/t)(Pesetas/t)
Soils-Civil Engineering	Low or none	<ul style="list-style-type: none"> • Grit • Construction and demolition waste • Stabilized biowaste 	<ul style="list-style-type: none"> • Land recovery and landscaping activities (public/private) 	0-3.6 (0-600)
Agriculture	Depends on type of crop	<ul style="list-style-type: none"> • Chemical fertilizers • Cattle-breeding waste 	<ul style="list-style-type: none"> □ Farmers (private) 	3.6-11 (600-1,830)
Landscaping	Low or none	<ul style="list-style-type: none"> • Tree bark • Peat 	<ul style="list-style-type: none"> □ Land recovery and landscaping activities (public/private) 	11-22 (1,830-3,660)
Domestic Gardening	Medium	<ul style="list-style-type: none"> • Peat-derived products 	<ul style="list-style-type: none"> □ Producers of soil improvers, garden centres and individuals (private) 	22-33 (3,660-5,490) 36-73 (5,990-12,145) (packaged)
Nursery Gardens	Depends on type of plant	<ul style="list-style-type: none"> • Peat-derived products 	<ul style="list-style-type: none"> • Producers of soil improvers (private) • Nursery Gardens (private) 	22-33 (3,660-5,490)

Table 2. Aspects of compost use

9. MARKET INCENTIVES

Two ways can be distinguished for supporting the marketing of compost:

a) Institutional Support

This support is aimed at encouraging the trade in compost by means of regulations, plans, programmes and subsidies, ensuring the quality levels required by consumers.

Local and regional authorities are responsible for managing waste and can influence the compost market, on the one hand, by harmonizing policies in line with the Draft Directive and, on the other hand, by demanding that the compost meets the requirements set out in the Landfill Directive and levying charges on landfill so as to favour composting.

The market-leading countries have already introduced these measures. Furthermore, the local authorities in these countries stimulate domestic composting to produce a zero-cost compost for self-consumption and so allow a reduction in the waste collection charge through the generation of less waste requiring external management.

The authorities conduct educational and awareness campaigns for the general public in order to improve the image of compost as a product and foster its placement on the market for both large and small consumers.

b) Private Support

This comprises the use of marketing and public relations strategies by the companies producing compost. Companies often join together to form associations representing their shared interests and allowing them to pursue common goals with greater strength. This option would be half-way between the two routes indicated above.

Shared marketing instruments such as market surveys or sales strategies have been used to a very limited extent on the compost market. It has only recently begun to be developed in the countries leading this market.

These countries have set up discussion forums with the people or groups involved in the compost market, such as consumers, businesses, farming organizations, etc. This allows them to conduct public relations activities, sales promotion, advertising campaigns, etc. and is an attempt to evolve towards the idea that compost is a quality product.

Companies will have to know the market's demands and develop new products, correctly informing the client on the uses of each type, highlighting this information in a clearly visible place, as well as offering advice before, during and after the sale. There are cases of companies in Germany designing à la carte products, corresponding to the client's requirements. This is possible thanks to strict control of the compost's quality during and after production, as well as a careful selection of raw materials and processes.

A very effective sales instrument is the seal of quality or eco-label used as an assurance that the product on sale meets the quality requirements and, at the same time, giving an image of seriousness and reliability that is much appreciated by consumers.

10. ASSOCIATIONS FOR THE PROMOTION AND QUALITY OF COMPOST

There are associations of compost producers in the market-leading countries to look out for the interests of their members, the compost producers, by seeking a common sales strategy through product promotion campaigns and public awareness actions. Such associations also ensure that the requirements stipulated for compost quality are observed. These standards may be drawn up by the associations themselves or by national standards institutes and are more restrictive than even the legal requirements.

The implementation of a system guaranteeing the quality of the compost must not be limited to the establishment of a series of limit values for the end product, but must cover all stages of the treatment of biowaste.

In order to be able to cover all these stages, the quality assurance system must take into account the raw materials, limit values for heavy metals, quality criteria, external and internal verification processes for products and/or production systems, product brands or seals of quality, a quality assurance certificate for the plant, a statement of the compost's properties, usage and application recommendations, expertise and qualifications of the operator, management and operating systems at the plant, annual certificates, transport, ...

In addition, it is necessary for the system to have some sort of recognition and it must obtain the backing of the authorities to prevent plagiarism or fraudulent use of logos, labels or seals.

The leading countries in Europe already have quality assurance systems in place, although at different stages of development. Germany, considered a pioneer in compost-related subjects, once more leads the way with its highly-advanced quality system and the largest number of operating plants with quality certificates. Austria, the Netherlands and Flanders have already begun to implement systems like this quite successfully. Denmark is still in the early stages of rolling out such a system.

All of these countries, with the exception of Denmark, also have quality assurance associations available to carry out several of the tasks associated with assuring compost quality. These associations are responsible for drawing up the different quality systems in each country and supervising their fulfilment. They carry out follow-up activities in the form of quality assurance inspections of the plants and regular analyses of compost samples. They are also in charge of issuing the product quality labels and, when the stipulated requisites are not met, they refuse or withdraw the use of such labels.

The Organizations in charge of compost quality and promotion in the countries in question are as follows:
Germany:

- ⇒ BGK: Federal Organization for Compost Quality
- ⇒ RAL: German Regulation and Standardization Institute

Austria:

- ⇒ KGVÖ: Austrian Association for Compost Quality
- ⇒ ÖNORM: Austrian Standardization Institute
- ⇒ Denmark:

⇒ Composting Group (within DAKOFA, the Danish Association of Waste Management Companies)

The Netherlands:

⇒ VVAV: Association of Compost Producers

⇒ KIWA: Official Certification Institute

Flanders:

⇒ VLACO: Flemish Organization for the Promotion of Composting

In Flanders, the VLACO organization is working intently on achieving an integrated quality assurance system for compost. In the Netherlands, the authority to certify compost quality is shared by the KIWA, which takes care of inspection and certification, and the VVAV, which assists the plants with operational issues and in the promotion of high quality compost. In both Austria and Germany, there are compost quality associations (KGVÖ and BGK, respectively) that take care of establishing standards, certification processes and the granting of quality seals or labels.

Within the scope of the EU, a number of criteria have also been drawn up to ensure the quality of soil improvers, including compost. These criteria are included in Commission Decision 98/488/EC dated April 7th, 1998, which reviewed the environmental criteria for the award of the Community Ecology Label to soil improvers, as stipulated under Commission Decision 94/923/EC. The Schedule to this decision stipulates the criteria on the provenance of the product, as well as its effects on soil degradation, water pollution and the nutrient load. It also specifies the information that must be supplied to consumers through packaging or leaflets as well as the characteristics of the product in terms of composition, health standards and safety. In addition, it also specifies the problems that these products must avoid and the testing and analytical methods that must be observed.