

The process of composting is a technique in which the natural process every organic substance undergoes through the action of microbes is controlled, accelerated and improved.

It is an "aerobic process of biological decomposition of organic substances which occurs under controlled conditions, allowing us to obtain a biologically stable product in which the organic component presents a high degree of evolution" (Keener et al., 1993). Rich in humus, in active microbial flora and in micro-elements, compost is suitable for many agricultural uses, from greenhouse plants to open field cultivation.

The composting process takes place essentially in two phases:

- Bio-oxidization, in which the mass is cleansed: this is the active phase (known as the high rate, active composting time), characterised by intensive processes of degradation of the organic components which can be broken down more easily

- The maturing process, during which the product becomes stable and enriched with humic molecules. This is known as the curing phase, and is characterised by processes of transformation of the organic substance, the maximum expression of which is the formation of humic substances.

The composting process can be carried out with selected organic waste (for example organic waste collected separately from general household waste, or organic waste collected from agri-business), from which is produced "High quality compost", a composted soil improver for use in agriculture or floriculture.

The organic fraction obtained from non-separated solid waste is treated by means of a mechanical-biological system of composting to obtain a Stabilised Organic Fraction for non-agricultural use, for example landscaping and land reclamation such as filling in old quarries, or for daily covering of landfill sites.

COMPOSTING OF PRE-SELECTED ORGANIC WASTE

In recent years the recovery of selected organic waste for the production of High Quality Compost has increased significantly. In 1993 there were 10 composting plants in Italy, dealing with approximately 100,000 tonnes of waste per annum, whereas in 2011, (the latest APAT-ONR statistics available), this had increased to 252 composting plants treating

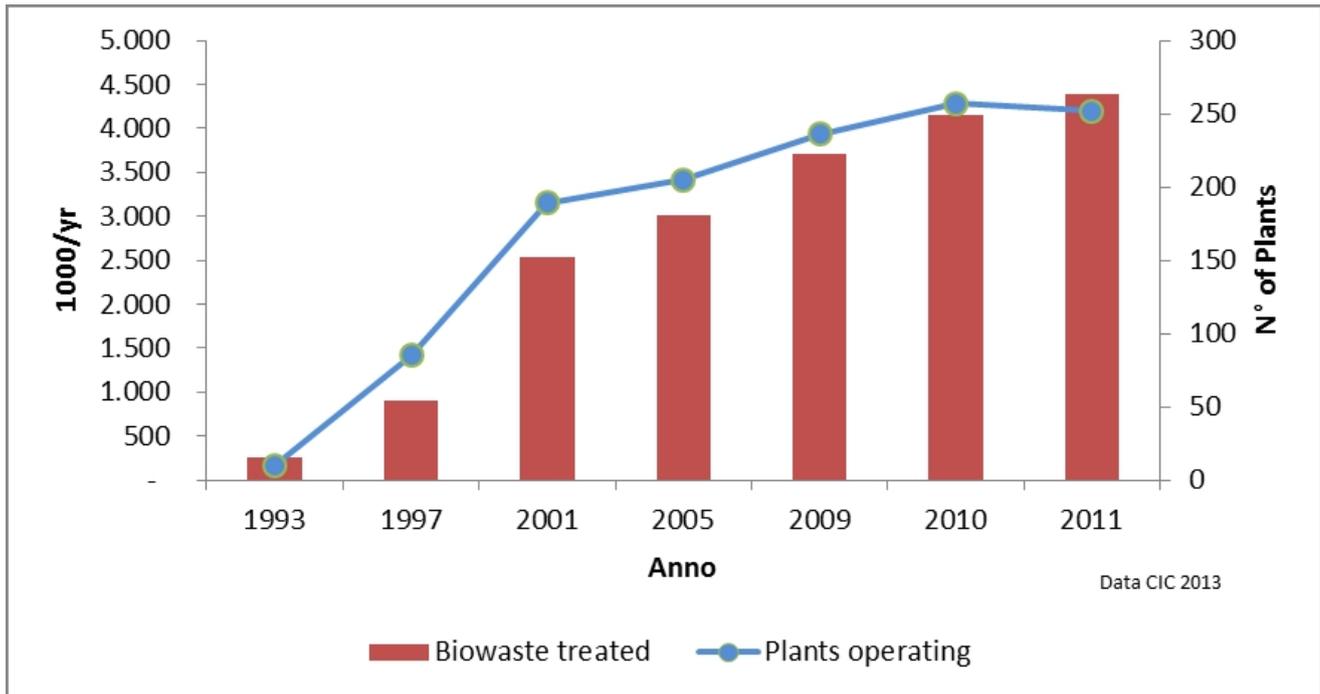
THE COMPOSTING PROCESS

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approximately 4.5 million tonnes of separately collected organic waste a year.

These composting plants are concentrated in northern and central Italy, where systems of separate organic waste collection of household waste are more advanced, and where the regional authorities have activated plans and publicity to favour this process.

Today, Italy is the second European country with the highest number of composting plants, even if several countries such as Austria, Holland, Denmark and the Flanders part of Belgium have a larger pro-capita operating capacity.



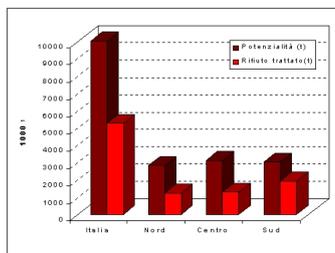
Source: CIC 2013 Annual Report

BIOLOGICAL TREATMENT OF NON-SEPARATED SOLID WASTE

Biological treatment is carried out on the organic fraction of solid waste which is not collected separately, but obtained from the mechanical sorting of solid waste after it is collected.

This mechanical-biological treatment, in all its phases, (stabilisation before landfill, biological drying, production of stabilised fractions for landscaping), is an important part of the waste management system at European level. With the imminent application of legislation on landfills (Decree 99/31) which provides for the progressive reduction of the percentage of organic substances present in the waste destined for landfill sites, a further increase in the number of composting facilities and the total treatment capacity is forecast.

According to data collected in 2003 by APAT-ONR (relating to 2002), there were 90 treatment plants operating in Italy, which treated approximately 5.6 million tonnes of urban waste, while the total capacity was approx. 10 million tonnes.



Source: APAT-ONR, 2003 Waste Report

It is noticeable that the majority of the plants are situated in northern and central Italy, but the geographical distribution is more equal than for plants which treat selected organic waste.

For a more in-depth treatment of this topic see [the publications](#) [of the CIC](#)