



New Soil Strategy - healthy soil for a healthy life

The European Compost Network ECN welcomes the roadmap of the New Soil Strategy, and calls on the European Commission to strengthen its policy by:

1. Recognising the numerous benefits for soil from compost application, including carbon storage
2. Exploring the best practices and bottom-up approaches to save organics in soil
3. Promoting their replication across the EU

Introduction

The European Compost Network (ECN) highlights that **soils are essential ecosystems which deliver valuable services** such as the provision of food, energy and raw materials, carbon sequestration, water purification and infiltration, nutrient regulation, pest control and recreation. Healthy soils provide these functions simultaneously, therefore, soil is crucial for fighting climate change, protecting human health, safeguarding biodiversity and ensuring food security. Translated in political language, healthy soils are a key enabler to achieve the objectives of the European Green Deal such as climate neutrality, biodiversity restoration, zero pollution, land degradation neutrality, sustainable food systems and a resilient environment.

However, soil health is at risk in Europe and globally. For instance, 12.7% of European soil is affected by moderate to high erosion, causing an estimated loss of agricultural production in the EU of €1.25 billion per year. In Southern, Central and Eastern Europe 25% of soils show high or very high risk of desertification corresponding to about 411 000 km². Large parts of Southern Europe are likely to become desertified by 2050. Moreover, the European Environment Agency recently concluded that the lack of a comprehensive and coherent policy framework which includes binding targets, incentives and measures to protect land and soil is a key gap that reduces the effectiveness of the existing policies and may limit Europe's ability to achieve future objectives¹.

The **European Compost Network (ECN) highlights the importance of saving organics in soils** by closing the biological cycle and returning high quality compost and digestate from bio-waste to land.

ECN welcomes the roadmap for the upcoming updated EU soil strategy and stays ready to be involved in all the consultative activities, workshops, auditions, conferences, webinars and similia organised by the European Commission and other institutional or governmental actors. ECN is a European association which gathers national compost and anaerobic digestion associations, quality assurance organizations, private companies, universities and research centres and individuals with researching interest in sustainable bio-waste management and soil science. **ECN operates on the European level for almost 20 years** and it allows politicians,

¹ European Environment Agency (2019) The European Environment: State and Outlook 2020

public authorities, researchers, investors and other stakeholders to exchange information, ideas and statistics with the European main players of the bio-waste recycling sector.

ECN strongly support the European Commission to update EU Soil Thematic Strategy to address soil and land degradation in a comprehensive way and achieve land degradation neutrality by 2030.

Benefits of compost application

The main outputs of bio-waste recycling are compost and digestate. **Compost is stabilized and sanitized organic matter that is widely and safely used for improving quality, health and fertility of soil** (Figure 1). Due to its higher nutrient content, digestate is used as an organic fertiliser with soil improving effects^{2, 3}.

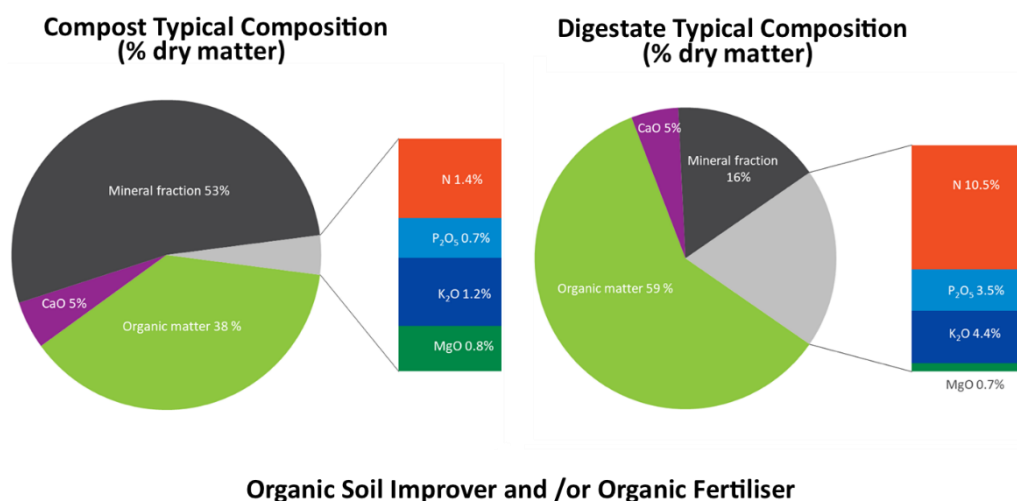


Figure 1: Typical composition of compost and digestate from bio-waste⁴

The main benefits of compost application to land are seen in the medium-to-long term (Figure 2). Compost replenishes the fertile layer of humus in the soils. When soil is rich in humus, it can store more carbon and additional benefits materialise, such as enhanced water holding capacity; improved soil structure which reduces the risk of erosion; fostered nutrient exchange

² The European Compost Network has published two new factsheets on 'Soil Structure & Carbon Storage' and on 'Soil Fertility & Productivity' in its publication edition on the 'Sustainable Use of Compost and digestate'.

<https://www.compostnetwork.info/two-new-factsheets-on-the-sustainable-use-of-compost-published/>

³ The EU Fertilising Product Regulation establishes minimum quality and safety requirements for compost and digestate for being used as an organic soil improver or organic fertiliser.

⁴ ECN 2019: ECN Status Report 2019. Overview of bio-waste collection, treatment & markets across Europe. <https://www.compostnetwork.info/download/ecn-status-report-2019-european-bio-waste-management-overview-of-bio-waste-collection-treatment-markets-across-europe-2/>

capacity which reduces the risk of nutrient loss; and increased microbial activity in soil which reduces the risk of disease⁵. **The main benefits of applying digestate** are providing nutrients in a short-term and to replace mineral fertilisers (NPK) from primary resources.

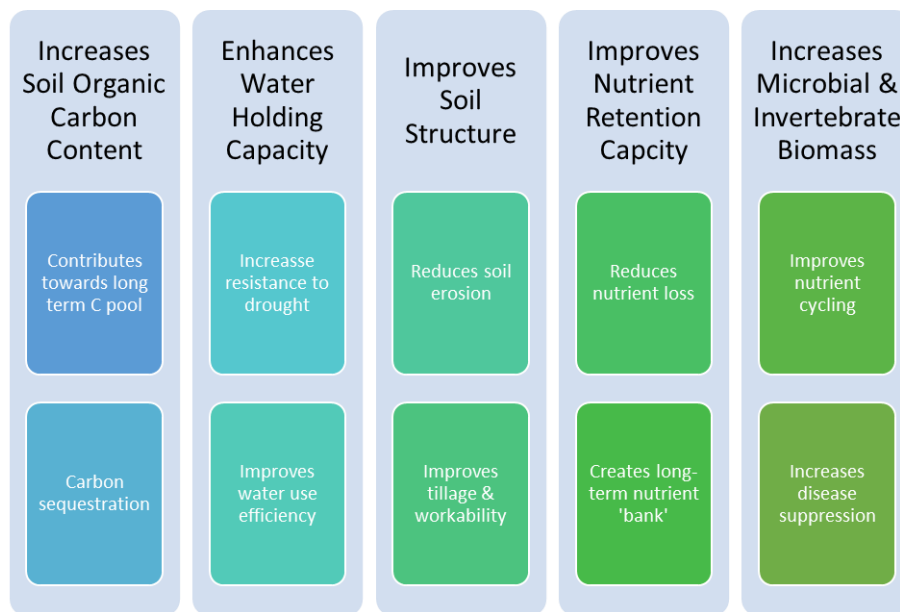


Figure 2: main benefits of compost application to land

Quality compost and digestate should only be derived from clean organic (bio-waste) feedstocks which have been kept and collected separately from other wastes. In addition, it is also important to ensure that composting and any associated anaerobic digestion processes are quality assured, with the end products being tested regularly to monitor quality. Since 2010 ECN has established a harmonised quality assurance scheme for compost and digestate (**ECN-QAS**) according to which several national quality assurance schemes for compost and digestate are conformity assessed, like in Austria, Belgium, Germany and Italy (Figure 3).



Figure 3: national quality assurance schemes for compost and digestate based on ECN QAS

Erosion of soils can lead to degradation of soil organic carbon, which can be released as carbon dioxide or methane. Soil erosion therefore can contribute to climate change; whilst conversely, increasing soil organic matter can help sequester carbon. Studies have shown that every tonne of soil organic carbon holds the equivalent of about 3.67 tonnes of atmospheric carbon

⁵ Gilbert, J., Ricci-Jürgensen, M. and Ramola, A. (2020) *Benefits of Compost and Anaerobic Digestate When Applied to Soil*, ISWA, Rotterdam.

https://www.iswa.org/index.php?eID=tx_bee4memberships_download&fileUid=295

dioxide⁶. One tonne (fresh mass) compost applied to soil over one hectare results in a net CO₂-eq saving of 143 kg ha⁻¹ due to the increase in soil organic matter alone. Over a period of 4-12 years between 11% - 45% of the organic carbon applied to soil as compost remained as soil organic carbon. Soil organic carbon increases of between 50-70 kg C ha⁻¹ yr⁻¹ per tonne of compost are possible. Figure 4 shows the carbon sequestration potential of compost by 2030.

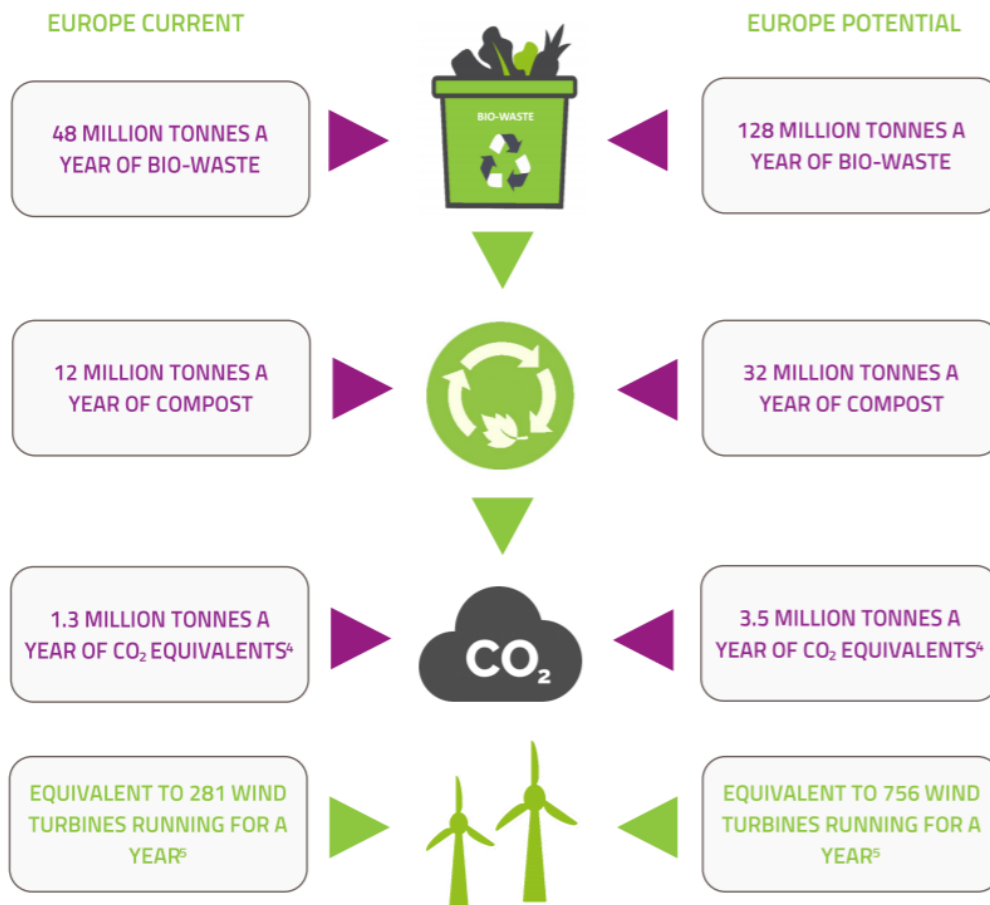


Figure 4 Carbon sequestration potential of high quality compost from separate collection

In a study comparing compost applications with other amendments⁷, the compost collected from Municipal Solid Waste (MSW) had a C content of 30.1% and 34.9% for the first and second year, respectively, and a C:N ratio around 15 in these both years. In this study it was reported that, when this compost was applied at a rate of 15 and 30 t ha⁻¹ yr⁻¹ for 20 years, the average values of carbon change were respectively 12.2 and 16.5 t C ha⁻¹. This is in line with another

⁶ Gilbert, J., Ricci-Jürgensen, M. and Ramola, A. (2020) Benefits of Compost and Anaerobic Digestate When Applied to Soil, ISWA, Rotterdam.

https://www.iswa.org/index.php?eID=tx_bee4memberships_download&fileUid=295

⁷ Farina R, Testani E, Campanelli G, Leteo F, Napoli R, Canali S, Tittarelli F (2018). Potential carbon sequestration in a Mediterranean organic vegetable cropping system. A model approach for evaluating the effects of compost and Agro-ecological Service Crops (ASCs). *Agricultural Systems*. 162: 239-248

estimation made by the International Solid Waste Association which predicts that when compost is applied to soil at a rate of 30 t ha⁻¹ year⁻¹ (fresh mass), soil organic carbon levels could increase by between 10 – 25 tonnes hectare⁻¹ over a 20-year period⁸. Also, another study⁹, highlighted increased soil carbon contents and increased net primary productivity (the amount of carbon dioxide plants take in during photosynthesis minus the amount of carbon dioxide the plants release during respiration) in orchards with compost treatments.

Financing positive externalities of compost: soil fertility and carbon sequestration

There are two kind of barriers to carbon sequestration: the positive externalities are not sufficiently rewarded, and the negative externalities are not sufficiently penalized. It means that the practitioners who work on the land are not sufficiently incentivized to switch from cheap fossil-based inputs to more costly recycled bio-based soil improvers. However, rewarding the climate action of soil carbon storage could trigger the needed price signals.

Nevertheless, monetary rewards and financial support are not the only leverage available from the European Union. A good and fair regulatory framework that does not generate distortions of competition and that enables a level playing field is also needed to prevent and minimize market failures and negative externalities.

The uptake of recycled bio-based materials in the economy is crucial to replace fossil-based materials but also for Member States to comply with the more ambitious recycling targets adopted in 2018¹⁰. The safety of compost and digestate has been already extensively proven and their certification should be everywhere a condition for their use. The debate should focus on the extent of the benefits that recycled bio-based materials allow to achieve and how to reward them properly¹¹.

We warmly recommend the European Commission make use of this comment when drafting the discussing the Updated Soil Thematic Strategy.

⁸ Gilbert, J., Ricci-Jürgensen, M. and Ramola, A. (2020) *Quantifying the Benefits to Soil of Applying Quality Compost*, ISWA, Rotterdam
https://www.iswa.org/index.php?eID=tx_bee4memberships_download&fileUId=310

⁹ Baldi E, Cavani L, Margon A, Quartieri M, Sorrenti G, Marzadori C, Toselli M. (2018). Effect of compost application on the dynamics of C in a nectarine orchard ecosystem. *Science of the Total Environment*. 637-638:918-925

¹⁰ By 2025, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55 % by weight; by 2030, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 60 % by weight; by 2035, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 65 % by weight.

¹¹ A starting point for the discussion should be Gilbert, J., Ricci-Jürgensen, M. and Ramola, A. (2020) *Quantifying the Benefits of Applying Quality Compost to Soil*, ISWA, Rotterdam.

Sustainable bio-waste management is a multi-disciplinary and cross-sectoral activity that involves many different actors across the whole society. Nevertheless, the value chain of compost and digestate – i.e. recycled bio-waste – is usually national or regional. **Compost and digestate are powerful enablers of circular economy and local sustainable development.** All the actors operating in this sector are moved by an inner desire of sustainability and they want to be a cornerstone of the European Green Deal vision.

About ECN

The European Compost Network is a membership organisation with 64 members from 27 European Countries. ECN represents 20 bio-waste organisations (compost and digestate quality assurance organisations) from 14 European Countries. Via the member organisations, ECN represents more than 4500 experts and plant operators with more than 45 million tonnes of biological waste treatment capacity.

Further information: www.compostnetwork.info