european bioplastics

Position of European Bioplastics

COMPOSTABLE PLASTICS AND THEIR CONTRIBUTION TO SOIL HEALTH

Compostable plastics evidently help to **increase the quality and volumes of separately collected organic waste,** which in turn is used to produce high-quality **compost that is crucial for healthier and more resilient soils.** By bringing more carbon-rich compost back to the soil, compostable plastics help to rebuild soil organic matter and **create carbon sinks** to combat climate change. Compostable plastics also play a crucial role in reducing microplastics in soil by **reducing the contamination of organic waste** streams. This is also true for **soil-biodegradable alternatives for agricultural plastic applications** and their positive impact on agricultural soils.

EUBP welcomes the European Commission's initiative to develop a new EU law on soil health to specify the conditions for a healthy soil and soil restoration. Soil is an essential non-renewable resource that plays a central role in our lives by providing healthy foods and sustainable materials for a growing world population. It is therefore crucial that the new EU Soil Health Law takes into consideration and supports the important role of compostable plastics in increasing the production of high-quality compost to increase soil organic matter and in keeping compost and soils clean.

Our recommendations for the planned EU Soil Health law:

- Recognise the link between the health, quality, and resilience of our soils and the quality and efficiency of our waste management, and in particular the ways in which an improved management of bio-waste can simultaneously benefit our soils,
- Recognise the contribution of certified compostable in increasing the quality and quantity of separately collected bio-waste to produce high-quality compost,
- The role of certified compostable plastics in reducing the contamination of captured bio-waste and compost with conventional plastic fragments,
- The contribution of certified soil-biodegradable plastics in protecting crops and soil while reducing the generation and accumulation of microplastics in the soil and other habitats, and
- Recognise the significant contributions of compost for Europe's ambition to become climate neutral by 2050.

Increasing the capture of organic waste to increase organic matter in soil

Only 16 percent of the food waste in Europe is currently being captured. Too much, an estimated amount of 50 to 60 tonnes of food waste, is still being landfilled or incinerated.[1] This is a considerable loss of organic matter and nutrients that could otherwise be used to produce compost or other valuable products in the bioeconomy.

Industrially compostable plastics (certified according to the harmonised European standard EN 13432) can provide value through organic recycling (i.e., industrial composting and anaerobic digestion) as an additional waste treatment option, and by providing the means to make the separate collection of household food waste more efficient.

Compostable plastics can bring several benefits to composting and organic waste management as they help to (a) increase the separate collection of bio-waste, (b) recover food-waste that is attached to (food) packaging that would otherwise be discarded and lost if the packaging is sieved out from the bio-waste stream, (c) reduce the contamination of compost with conventional plastics, and (d) reduce the moisture content and increase the bulking effect, which is useful when composting food waste.

The use of certified compostable plastic products is evidently contributing to a substantial increase in volumes of food waste being collected and composted: in Italy, for instance, where certified compostable packaging is widely supported and used, a separate collection rate of household food waste of 80 percent was achieved in 2018.[2]

Especially the upcoming mandatory separate collection of bio-waste in Europe by 2024 provides a sizeable opportunity for European soils. Compostable plastics can make a significant contribution to producing a higher volume and quality of valuable compost that benefits the soil health. Additionally, they help provide second-generation bio-based raw materials for industrial purposes, such as the production of new

[1] Zero Waste Europe (2020) Bio-waste generation in the EU: Current capture levels and future potential, https://zerowasteeurope.eu/wp-content/uploads/2020/07/2020_07_06_bic_zwe_report_bio_waste.pdf, https://biconsortium.eu/news/biowaste

[2] Italian compost association CIC, www.compost.it, and Zero Waste Europe (2020) "Bio-waste generation in the EU: Current capture levels and future potential." https://zerowasteeurope.eu/wp-content/uploads/2020/07/2020_07_06_bic_zwe_report_bio_waste.pdf

bio-based polymers or organic fertilisers, providing biological alternatives to traditional fertilisers and making the European fertilizer industry less externally dependent.

Reduction of contamination of organic waste and compost

Certified compostable plastics are specifically designed for organic recycling (i.e., industrial composting). Clear labelling schemes, e.g., with the widely used and accepted Seedling logo, makes it very easy and clear for consumers to identify the correct waste collection stream (i.e., bio-waste). If compostable plastics, however, do end up in conventional plastics recycling streams due to accidental misthrows, the existing sorting technologies are perfectly able to sort them out.

The opposite scenario, however, should be cause of concern: compost produced from separately collected bio-waste is increasingly contaminated with (micro)plastics stemming from conventional plastics impurities that were wrongly disposed of in the bio-waste.[3, 4, 5] Industrially compostable plastics can help to separately collect organic waste and thus reduce the contamination of bio-waste with conventional plastics, and ultimately reduce microplastics from conventional fossil-based polymers in the compost.

Benefits of compost for soil health

Organic matter is an essential component of soil. It provides the soil with structure and supplies nutrients. Compost is a useful soil improver due to its organic matter content and nutrients. Long-term studies have shown that repeated applications of quality compost to soil can increase soil organic carbon levels and help restore its functionality.[6] Compost also increases the soil's water holding capacity, an increasingly important property as this makes the soil more resilient to droughts and better able to withstand excessive rainfalls.

Clear requirements on the quality of compost to be safely applied to soil are laid down in the Fertilising Products Regulation (EU) 2019/1009, including allowed contaminant levels and requirements on the stability of compost in order to reduce uncontrolled carbon and ammonia emissions, nitrate leaching as well as potential phitotoxicity and oxygen uptake from soils. This highlights the necessity for compost to reach full stabilisation before leaving the compost plant. In Italy, for example, a 90 days treatment period[7] is legally mandated. This timeframe and the application of a full composting cycle makes sure the compost is stable and does not risk humus build-up and plant performance.[8]

Improving plant performance while reducing soil contamination

Biodegradable polymers have the advantage that they do not erode into permanent secondary microplastics upon degradation, because most natural environments habit microbes that are able to metabolise these polymers. Thus, the residence time is considerably lower for biodegradable polymers compared to conventional plastic materials.[9] This way, biodegradable plastics can help to minimise environmental impacts and reduce the accumulation of plastic particles in different environmental habitats.

Soil-biodegradable mulch films, for example, have been available on the EU market for many years, playing an essential role in modern agriculture as they help to increase yield, improve the quality of crops, enhance weed control, and reduce water irrigation and pesticides. Additionally, they offer distinctive advantages at the end of the crop cycle as they can be left on the field and ploughed under.

Compared to conventional (PE) plastic mulch films, which are either hard to collect or recycle, and that leave large fragments on the fields generating microplastics that leach into the soil, rivers, and oceans, soil biodegradable mulch films fully biodegrade in less than 2 years and do not cause accumulation in soils.[10] At the same time, the removal of conventional mulch films often leads to the removal of large amounts of soil from the fields as well.[11] This problem is solved when using soil-biodegradable mulch films that are left on the field. The European standard EN 17033 sets the requirements for

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[3] https://www.sepa.org.uk/media/327640/investigation-into-plastic-in-food-waste-derived-digestate-and-soil.pdf
[4] Weithmann et al., Science Advances 04 Apr 2018: Vol. 4, no. 4; "Organic fertilizer as a vehicle for the entry of microplastic into the environment"
[5] Kern et al., Müll und Abfall 05/2020, Kunststoffe im Kompost (Plastics in compost)
[6] Gilbert, J., Ricci-Jürgensen, M. and Ramola, A. (2020) A Summary of the Benefits of Compost and Anaerobic Digestate When Applied to Soil, ISWA, Rotterdam.
[7] Which aligns with the required 12 weeks disintegration timeframe set in the standard EN 13432 for industrially compostable plastics.
[8] ECBPI, 2021, Linking the issues of soil health, climate change, waste management and the bioeconomy, https://ecbpi.eu/wp-content/uploads/2021/10/soil-climate-waste-and-bioeconomy-paper-final-1.pdf
[9] M. Tosin et al. (2019) Biodegradation kinetics in soil of a multi-constituent biodegradable plastic, Polymer Degradation and stability, Volume 166, pp. 213-218.
[10] OWS, Expert Statement "(Bio)degradable mulch films", 2017
[11] Eunomia for the European Commission (2022) Conventional and Biodegradable Plastics in Agriculture, https://www.eunomia.co.uk/reports-tools/conventional-and-biodegradable-plastics-in-agriculture/

biodegradation of mulch films used in agriculture and horticulture. They include comprehensive ecotoxicity testing considering all relevant exposure pathways, and clear best practice guidelines.

The role of organic recycling in creating carbon sinks

Some of the carbon stored in bio-waste that is turned into compost through organic recycling can be converted into very stable forms and remain in the soil for decades. It has been estimated that every ton of compost (fresh mass) can increase soil organic carbon levels by 20 to 40 kg of carbon, which is equivalent to about 70 to 150 kg CO_2-eq.[12] In Europe, 12 million tonnes of compost are applied on land; leading to the carbon sequestration of 1.3 million tonnes of CO_2.[13]

By diverting bio-waste from mechanical recycling streams, incineration, or landfills, industrially compostable plastics help feed more bio-waste into organic recycling and contributing, through the production of high-quality compost, towards creating carbon sinks and helping to reduce CO_2 emissions.

About European Bioplastics

European Bioplastics (EUBP) represents the interests of more than 70 member companies throughout the European Union. With members from the entire value chain, European Bioplastics serves as both a contact platform and catalyst for advancing the objectives of the growing bioplastics industry. For further information, please visit http://european-bioplastics.org.

[12] Gilbert, J., Ricci-Jürgensen, M. and Ramola, A. (2020) Quantifying the Benefits of Applying Quality Compost to Soil, ISWA, Rotterdam.
[13] ECBPI, 2021, Linking the issues of soil health, climate change, waste management and the bioeconomy, https://ecbpi.eu/wp-content/uploads/2021/10/soil-climate-waste-and-bioeconomy-paper-final-1.pdf

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