

Practice Abstract 1 : Plasticulture – what is the link between plastics and agriculture?



Plastic in agriculture is widely used nowadays.

It has many separate applications, from mulching films, to wrapping silage, bags and agrochemical containers or contributing to irrigation or greenhouse systems .

By using plastics, it has been possible to extend the growing season, reduce the need for herbicides, or increase agricultural production, which all contribute to food security. Plastics have been a relatively affordable, and practical solution for various farming practices, resulting in agricultural plastic products being key assets both in crop and livestock production.

Besides their benefits for agriculture, however, plastics, and their residues, could have a potential negative impact on the health and sustainability of soils as well as on quality and value of the landscape .

Since in some production system plastics get deployed directly in the environment, it sometimes comes in contact with soil especially following mishandling. During ageing of agricultural plastics and improper management of agricultural plastic waste, littering and fragmentation can occur with the accumulation of micro and nanoplastics in the soil. These are small fragments (sometimes in microscopic or nanoscopic size) of plastic that can affect soil health and fertility. Furthermore, chemical additives present in plastic products could be potentially released over time as well, which then enter the soil, and through there it gets transferred to other parts of the environment.

Once these plastics are in the soil, often in the form of micro- or nano plastics, it is nearly impossible to remove and retrieve them. Such an accumulation over time raises concerns for soil health, as it can have measurable impacts including, in the worst case, documented irreversible deterioration of soil fertility with 20% decreased crop yields.



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Overall, plastics can be responsible for significant pollution of agricultural land during their use or after their useful timeline due to the applied practices including mismanagement.

Furthermore, not only our agricultural land is impacted, but also the quality of our water, as microplastics from the fields can get into groundwater or other surrounding water sources, and thus into our water systems. In fact, “more than 80% of the plastics found in marine environments is said to be produced, consumed and disposed of on land”,^[1] highlighting the main sources of plastic pollution to be addressed for our seas and oceans.

Hence a better understanding of the impacts and life cycles of plastic pollution is needed, to better protect our soils. In doing so, current research programs aim to fill in the existing knowledge gaps by studying the sources, behavior, and ecological effects of micro- and nano plastics in agricultural soils, resulting from the use of agricultural plastics.

The goal is to find a way to balance the use of plastics against their potential negative impacts of plastic residues, so that we may ensure that we can make a sustainable use while protecting the assets of our future: our soils, our waters.

Research programmes like PAPILLONS (and others) are determined to provide farmers, plastic industries and regulators with scientific awareness on the real scale of the problem and contribute to find together a way for sustainable agricultural practices.



[1]<https://ieep.eu/uploads/articles/attachments/3a12ecc3-7d09-4e41-b67c-b8350b5ae619/Plastic%20pollution%20in%20soil.pdf?v=63695425214>



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