

# Impact on wheat health and rhizosphere microbiome of compost produced by adding compostable bioplastic packaging to organic waste: A field experiment

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There is a growing global demand for innovative and sustainable bioplastic packaging to reduce the use of petroleum-based plastics (Álvarez-Chávez, *et al.*, 2012). In line with the principle of a circular bio-economy, the use of compostable bioplastics (BPs) can bring several benefits to composting and urban organic waste (UOW) management by reducing contamination with conventional plastics and enabling the production of compost that can be safely used as agricultural fertiliser. However, the potential impact of the presence of BPs in compost on the soil microbiome and plant health needs to be clearly assessed, particularly in field trials. (Santini *et al.*, 2024).

This study, part of the ABRIOPACK project, aims to evaluate and compare the effects of 'standard' compost (Com) obtained from UOW and UOW composted with 3% BPs (Mater-bi, Novamont) (BioP) on the health of wheat (*T. aestivum*) and its rhizosphere microbiome.

Composting was carried out in a industrial composting plant (COSMARI SRL, Tolentino, Italy) under the supervision of the Consorzio Italiano Compostatori (CIC, Rome, Italy). In 2021-2022, field trials were carried out at an Agricultural Experimental Station (CERMIS, Tolentino, Italy). Three treatments (Com, BioP and Ctrl, no compost) were tested with five replicates each (Fig.1).

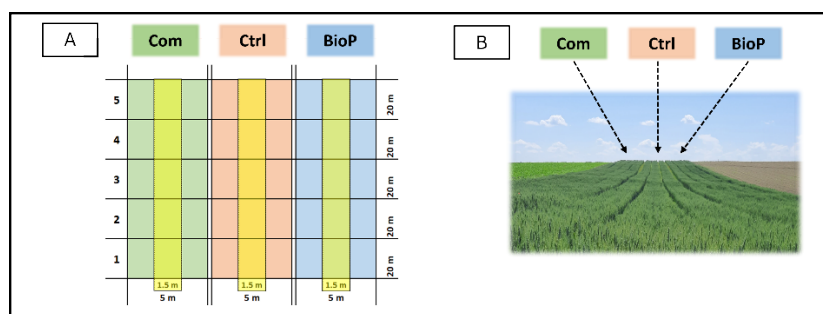


Fig.1 Layout of the experimental plots. A) Schematic diagram of the 3 test plots (Com, Ctrl, BioP of 500 m<sup>2</sup> each) and relative subplots (100 m<sup>2</sup>, from 1 to 5). B) Photo of the experimental plots in May 2022. For each treatment, 1000 kg of each type of compost (Com, BioP) were uniformly distributed over the entire corresponding plots (500 m<sup>2</sup>). Soil sampling and harvesting were carried out in the center of each plot, within the yellow area. The composts were distributed in 0-25 cm layer of soil, one month before wheat sowing.

