MICROPLASTICS IN AGRICULTURAL SOILS – AWARENESS, KNOWLEDGE AND BIODEGRADABLE PRODUCT ALTERNATIVES



MISSION OF NETmicroplastic

Deepen our knowledge and foster science-based, multidimensional assessment of microplastics in soil

To address the many gaps in our understanding of the sources and pathways of microplastics in agricultural environments, the NETmicroplastic partnership, initiated by the Austrian Institute of Technology (AIT), connects actors and stakeholders from relevant sectors through workshops, webinars and science communication events. A strong knowledge base has been built through tailored surveys of farmers and winegrowers, students, compost facility owners and waste management companies. The data was supplemented by information gathered at agricultural fairs from plastic tool manufacturers and distributors, and from interviews with recycling facilities, to produce a comprehensive regional concept paper.



NETmicroplastic DATABASE

The NETmicroplastic database was created to provide an overview of the current state of microplastics in soil, specifically in Austria and Europe. The research aimed to identify relevant projects, strategies, policies, and initiatives addressing microplastics in soil.

https://www.net-microplastic.eu/database/

Projects were selected based on their focus on microplastics in soil systems or related analytical methods. Policies and strategies were gathered through targeted internet searches and contributions from the NETmicroplastics core network partners. This database is continuously updated as a "living" resource and invites further suggestions for additional relevant entries

A mini-questionnaire among compost

that 70% of disruptive substances in

facility owners and manufacturers revealed

collected waste are plastic, with 74% being

manually sorted out before composting. To

reduce plastic contamination, suggestions

(30%), better public education (26%), and

stronger control or sanctions for improper

included improving collection systems

disposal (15%). A smaller group (17%)

advocated for more degradable plastic

alternatives or even bans on current

materials.



COMPOST AND WASTE MANAGEMENT

The contamination of compost with microplastics is largely due to improper biowaste collection, as many people dispose of plastic bags—both conventional and those labeled as biodegradable along with their organic waste. In Austria, some cities allow the use of (bio)plastics as collection aids for biowaste, while others do not, highlighting the need for a unified approach.



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BIODEGRADABLE PRODUCT ALTERNATIVES From the farmer's and winegrower's

From the farmer's and winegrower's perspective, there is a need to make biodegradable products more widely available to users to replace conventional plastic products. At present, growers are experimenting with different products, due to a lack of information and knowledge about alternative products and their properties. As a result, NETmicroplastic is preparing a leaflet that will list relevant biodegradable products together with information on user experiences. Publication of the leaflet is planned for autumn 2025.



FARMERS' AND WINEGROWERS' VIEW

In cooperation with the Chamber of Agriculture of Lower Austria, an online survey was conducted on plastic materials and equipment used in agriculture. The majority (85-100%) of respondents (n=97) are aware that film, nets, irrigation pipes, clips and growing sheets contain or are made of plastic, while knowledge of plastic in fertilisers (14%), treated/coated seeds (9%) and plant protection products (36%) is limited.

The majority of respondents (87%) would be willing to try alternative products, especially twine for tying vines and straw bales, irrigation products, fertilisers and plant production products, if they were in the same price range and of comparable quality in terms of handling and durability to conventional products. Awareness of certification labels for biodegradable plastic products was low, with only 21% of respondents recognising the TÜV Austria label and only 3.4% having ever heard of the DIN label.

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STUDENTS' VIEW

An email survey among students (n=417) in Lower Austria reveals that students from all fields are well-informed about microplastics. While 98% of students have heard of microplastics, most associate them with water and marine pollution (88%) rather than agriculture (22%), with 16% unaware of their presence in soil. Students' knowledge is highest for water-based microplastics and lowest for those in agriculture. The internet (82%) and television (68%) are the primary sources of information, while scientific journals (37%) and courses (36%) are less influential.

The main sources of microplastics in soil, according to respondents, are littering, fertilizer use, and tire wear. A majority (53%) believe microplastics are very harmful. While 65% have heard of bioplastics, 49% think they are less harmful than conventional plastics, though the term "bio" leads to oversimplified positive associations. The survey suggests the need for clearer communication about the different types of plastic, especially bioplastics, and their environmental impact.



