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AGRICULTURE & INNOVATION

Reducing the plastic footprint of agriculture

How to reduce the plastic footprint in agriculture?

Plastic is a cheap, light and resistant material that is widely used in different agricultural practices. It can provide many services such as increasing soil temperature and water use efficiency, decreasing the need for herbicide use or protecting against unfavourable weather conditions. Some of the most common uses of plastic in agriculture are:

- ▶ bale wrapping for silage production
- ▶ greenhouse cover
- ▶ plastic mulching
- ▶ low tunnels
- ▶ irrigation pipes/tapes

However, the wide use of plastics also brings along several challenges. The 20 experts in the EIP-AGRI Focus Group 'Reducing the plastic footprint of agriculture' listed additional waste management and the contamination of natural environment as the most important ones, followed by contamination of crops and the implied decrease of the value of the products. Despite the negative effects it is difficult to replace plastics without compromising the profitability of farming. Therefore, the Focus Group looked for solutions for a more sustainable use of plastics.

Two aspects can define the plastic footprint of agriculture: the use of renewable resources in plastics design and development, and the contamination of the environment with plastic debris including microplastics. To reduce the footprint two main approaches were discussed. First, the end-of-life management of plastics needs to be improved, starting from the design of materials that are easy to recycle, up to improved collection schemes of plastic waste from farms. Second, it is important to continue developing biodegradable plastics and encourage their use in agricultural practices where recycling is difficult, such as mulching.

Additionally, the low awareness on agriplastics was highlighted. There is an urgent need for more information on effects of plastic contamination as well as a better communication of the available knowledge to farmers and advisers on how to improve plastic management on farm level.

"If we want to reduce the environmental impact of plastic use, we need to focus on improving the management of plastics - there are many good practices and a lot of accumulated experience which is not necessarily well- disseminated."

- Bernard Le Moine (France),

expert from the EIP-AGRI Focus Group Reducing the plastic footprint of agriculture -

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Ideas for Operational Groups

- ▶ Identify the best plastic debris removal techniques for specific agricultural management types
- ▶ Conceive a life cycle analysis of conventional plastic from virgin material, recycled plastic, bio-based, and biodegradable plastics for specific agricultural uses
- ▶ Test different plastic design methods to facilitate future waste recycling
- ▶ Optimise plastic cleaning techniques on the farm
- ▶ Analyse the pros and cons of the use of biodegradable polytunnels
- ▶ Find alternatives to polypropylene thermal blankets
- ▶ Test the usability, durability, and costs of using more resistant plastic in specific agricultural systems

Research needs

- ▶ Develop more resistant and easily recyclable plastics
- ▶ Improve recycling processes to better deal with soilage and contamination of plastic waste e.g., by using microorganisms in the process
- ▶ Develop and test more resistant materials for agriplastics that are directly exposed to the environment such as mulch, greenhouse covers, irrigation pipes, nets, and tunnels. This will enable to limit the fragmentation of plastic and therefore be the first step to reduce the emission of macro- and microplastics to the environment
- ▶ Improve the production processes of biodegradable plastics to make them more profitable. This includes studying the degradation in specific pedoclimatic conditions to ensure the desired degradation time on farm and upscaling the production of biodegradable plastics to make them more affordable
- ▶ Investigate the long-term environmental effects of plastic debris on different organisms considering that aged plastics can have different effects compared to pristine material

More ideas for Operational Groups and research needs are in the Focus final report

More information on the EIP-AGRI website



[Final report](#)

[Operational Groups related to reducing plastic footprint](#)

[Focus Group webpage](#)

Inspirational ideas:

- [Biodegradable mulch films to reduce plastic footprint \(Spain\)](#)
- [Olive stones to develop a new sustainable plastic \(Spain\)](#)

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