

Exploring the environmental implications of micro- and nano-plastics on agricultural soils



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on behalf of MINAGRIS

Contamination of agricultural soils by plastics



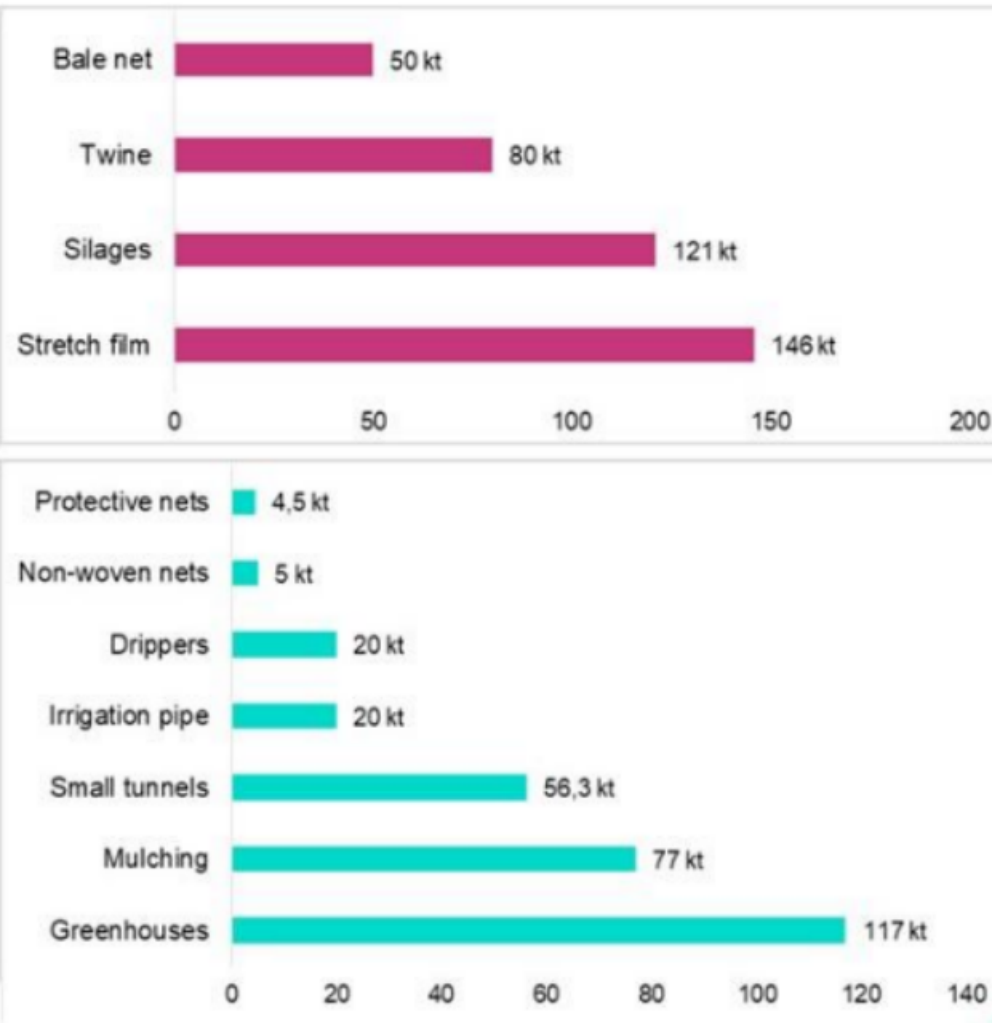
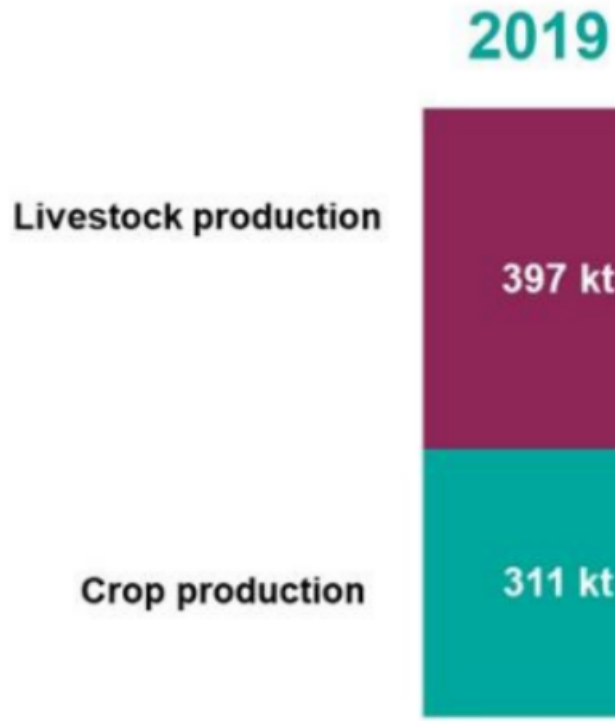
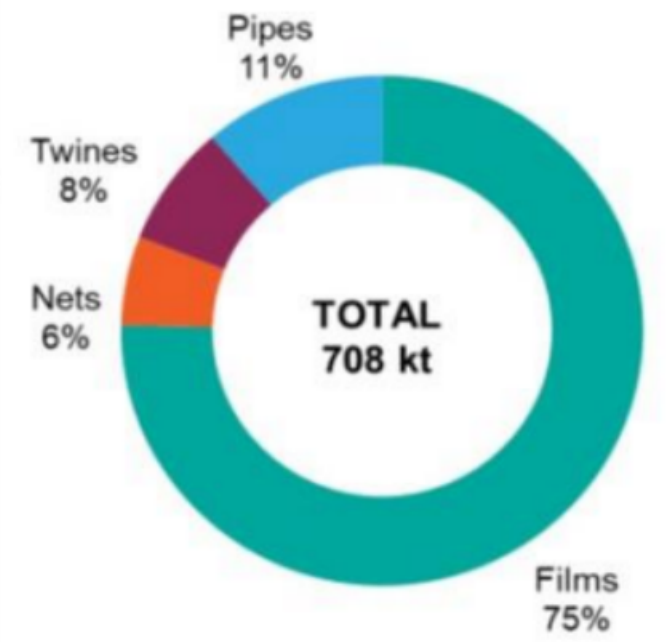
Biodegradable vs biobased plastics...

**Total:
49.1 Mt**

EU27+3 converters plastics demand

BY SEGMENTS & POLYMER 2020



A**B**

....alongside plastics from other industries entering agricultural soils!

Eunomia (2020); APE Europe (2020)

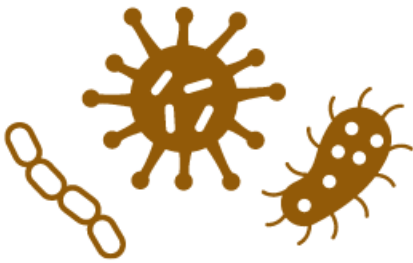
*Adapted from
Machado et al (2018)*



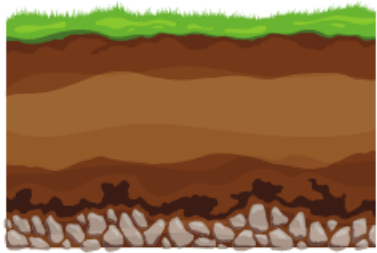
Water holding
capacity



Bulk density



Soil microbial
activity



Soil
structure/function

Type of plastic

Polyester



Polyacrylic



Polyethylene



Introducing MINAGRIS

Using a multi-actor approach, we are:

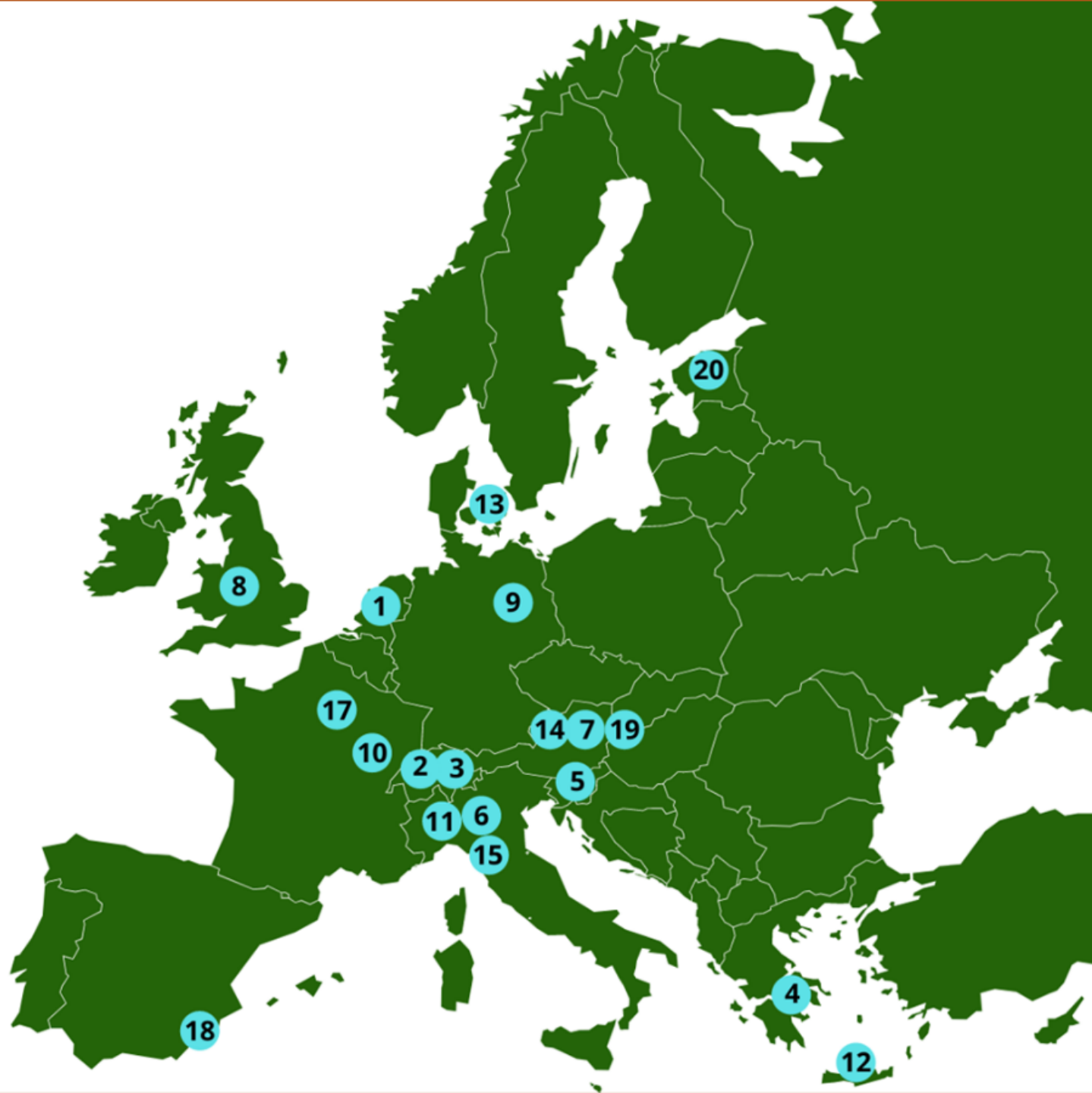
1. Providing a deeper understanding and tools to assess the **impact of MP and NP in agricultural soils on biodiversity, plant productivity and ecosystem services**
2. Examining **disaggregation fate** in the environment
3. Providing **recommendations for sustainable use** of plastic in agriculture at the farm and field level
4. **Engaging stakeholders and identifying needs**, improving farmer and citizen **awareness, joint development of novel strategies** for reducing plastic contamination.



Project team

MINAGRIS partner organisations

1. Wageningen University (NL)
2. University of Bern (CH)
3. FiBL Switzerland (CH)
4. University of Thessaly (GR)
5. University of Ljubljana (SL)
6. Università Cattolica del Sacro Cuore (IT)
7. FiBL Austria (AT)
8. University of Gloucestershire (UK)
9. Freie University Berlin (DE)
10. INRAE (FR)
11. Polytechnic of Turin (IT)
12. CHQ Technologies (PC) (GR)
13. Technical University of Denmark (DK)
14. Austrian Agency for Health and Food Safety (AT)
15. NOVAMONT (IT)
16. Wageningen Food and Biobased Research (NL) (same as 1)
17. Euroquality (FR)
18. Camposeven (ES)
19. Spotteron (AT)
20. Estonian University of Life Sciences (EN)



Case study sites

11 case study sites

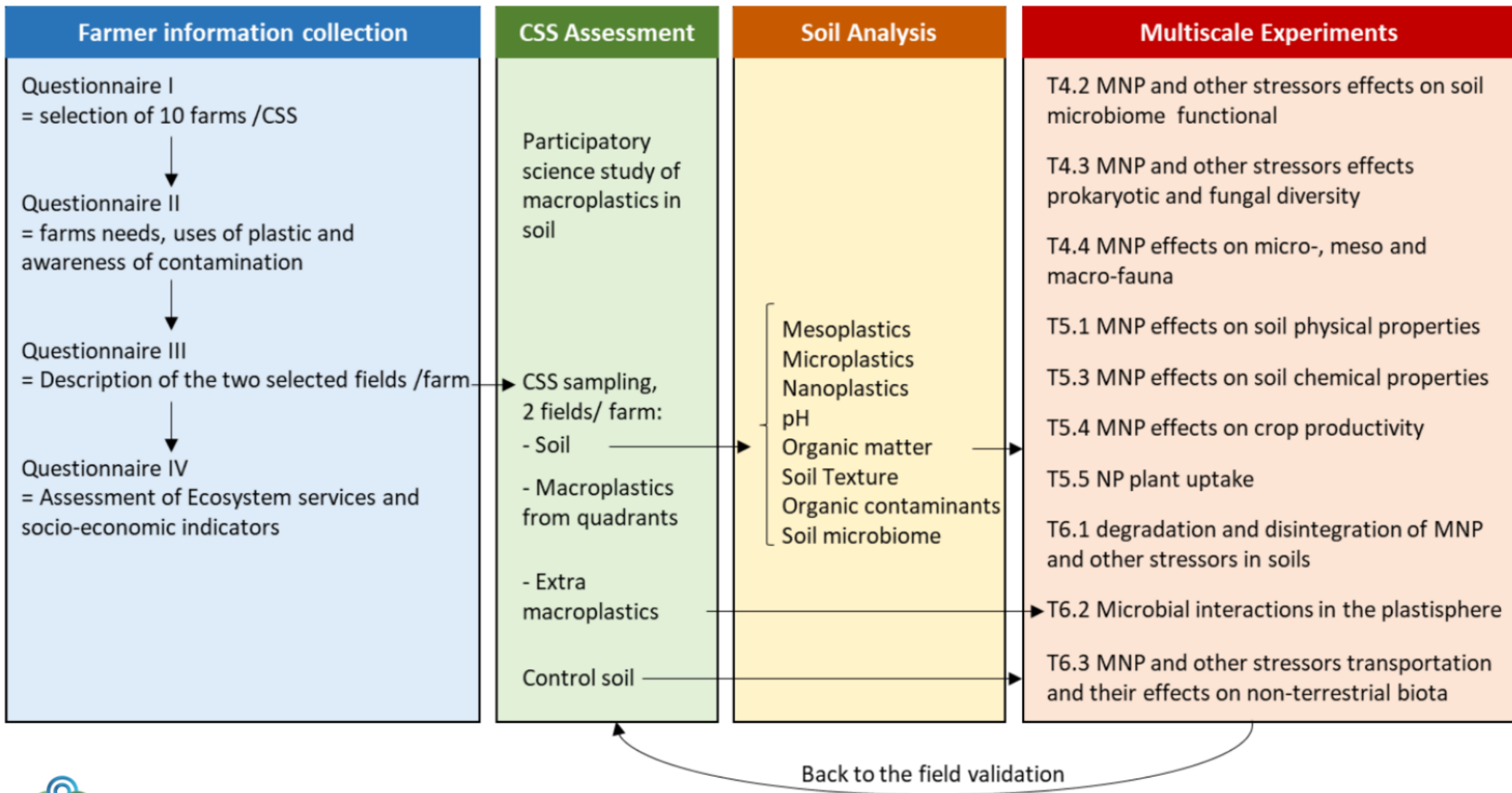
6 biogeographical regions

Range of farming practices

**At least 10 farms surveyed per
case study site**

- Case study site
- CSS/Experimental field station





Sampling campaign

440 samples being collected now, and again in 2025



Recruiting farmers - case study specific leaflets, open dialogue, clear benefits of participation, consolidation of tasks

Experimental results expected: 2023/4

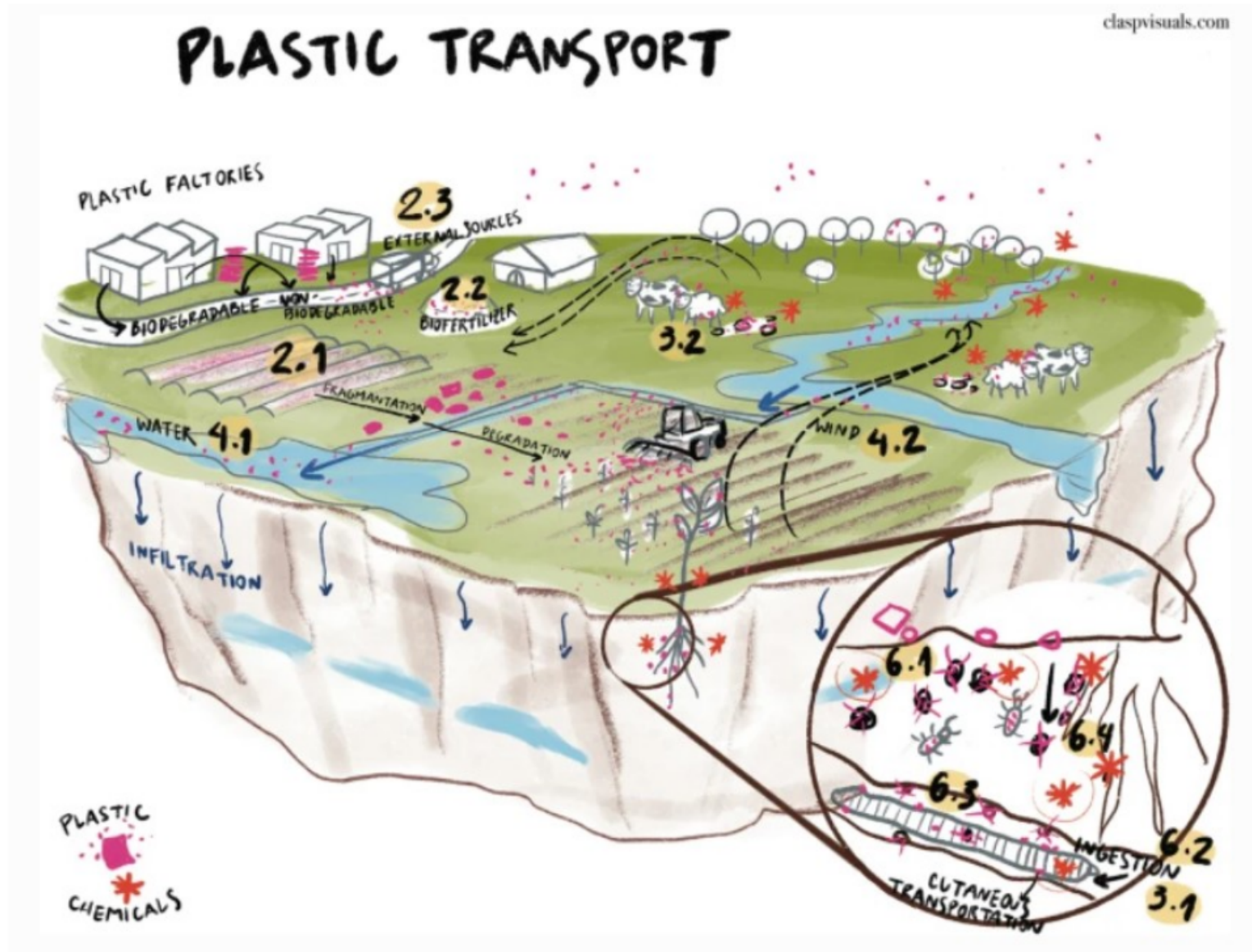
SoilPlastic: Citizen science app



Findings so far: Recent MINAGRIS review

found very little information available concerning microplastic transport in the terrestrial environment

Huerta Lwanga et al (2022)



[illegible]

Ingestion; dragging; cutaneous transport

Findings so far: review of information needs (yes, we're doing social science!)

Interviews across Europe with various EU-level and national stakeholders (n = 26) and case study farmers (n = 110).

- Widespread **lack of guidance and advice** directly relating to agricultural plastics - **alternatives, disposal (recycling/repurposing), environmental impacts**
- General recognition that advice and information of this nature **would be useful** for farmers
- **Municipal compost contamination** = big concern amongst farmers - awareness raising needed



Findings so far: review of information needs

Need for **clear, high-level guidance**



Potential for **multifunctional advice** (e.g., soil advisors could include plastic-related advice whilst visiting farms)

Guidance documents, videos, podcasts, webpages = useful if clear and concise



In-person advice (1:1 and group) remain key

Scientific publications, lengthy documents = not so much!

Interested in getting involved?



Thank you

Newsletter sign-up
<https://www.minagris.eu/>
@MinagrisEU

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cchivers@glos.ac.uk

Need social science/policy engagement research?

**Countryside & Community Research
Institute = largest specialise rural research
institute in the UK**



Get in touch!

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Newsletter: Issue #1

March 2022



MINAGRIS

In This Issue

Introducing the project	2
Our case study sites	3
Visiting the UK case study site	4
MINAGRIS 'kick-off' meeting	4
Plastic use in agriculture	5
MINAGRIS-PAPILLON stakeholder forum	6
MINAGRIS in the press	7-8
Key reading	9
MINAGRIS partners	10

Connect with us:



Hello, and a warm welcome...

...to our first newsletter!

In this edition, we will share updates on our 5-year EU funded Horizon 2020 project on agricultural plastic use. Working as a consortium of 20 partners across Europe, across 11 case study sites, MINAGRIS will:

- Assess the impact of plastic debris in agricultural soils on soil health, plant productivity and ecosystem services
- Improve our understanding of the movement and degradation of plastics in the environment
- Provide tools and recommendations for the sustainable use of plastic in agriculture at the farm and field levels
- Support safe and economically viable food systems in Europe



Professor Violette Geissen,
Project coordinator

We hope you enjoy our first newsletter. Please get in touch if you have any questions:
coordination@mail-minagris.eu.



EU Horizon 2020 grant agreement
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