## **Supplementary information**

## Agricultural soils and microplastics: are biosolids the problem?

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**Table S1** Blank contamination values in samples. Values are reported for whole blank sample (per sample vial). Average blank is the mean of all blanks (n=10) and the Limit of Detection (LOD) is 3.3 x the standard deviation.

	<b>Total microplastics</b>	AVP	Cellulose	EVA	Polyester	Polypropylene
Blank 1	0	0	0	0	0	0
Blank 2	4	1	0	1	0	2
Blank 3	1	0	0	0	1	0
Blank 4	0	0	0	0	0	0
Blank 5	6	0	0	0	5	1
Blank 6	9	0	0	0	9	0
Blank 7	0	0	0	0	0	0
Blank 8	0	0	0	0	0	0
Blank 9	0	0	0	0	0	0
Blank 10	5	2	1	2	0	0
Average blank	2.5	0.3	0.1	0.3	1.5	0.3
LOD	8.25	0.99	0.33	0.99	4.95	0.99

	Week	Total rainfall (mm)
	31.07.19-06.08.19	2
	07.08.19-13.08.19	24
A	14.08.19-20.08.19	23
August	21.08.19-27.08.19	0.6
	28.08.19-03.09.19	7
	Total	51
	29.01.20-04.02.20	13
	05.02.20-11.02.20	22
Fahrmann	12.02.20-18.02.20	57
February —	19.02.20-25.02.20	18
	26.02.20-03.03.20	31
	Total	122

**Table S2** Rainfall per week in in Southeast England during the two sampling months (August 2019 and February 2020; Environment Agency, 2020))

**Table S3** Polymers included in siMPle automated IR database (version 1.0.1) used for polymer identification

Polymer match				
Acrylates/Polyurethanes/Varnish (APV)				
Cellulose artificial modified				
Ethylene-Vinyl-Acetate (EVA)				
Nitrile rubber				
Polyamide				
Polybutadiene				
Polycaprolactone				
Polycarbonate				
Polychloroprene				
Polyester				
Polyetheretherketone				
Polyethylene				
Polyethylene chlorinated				
Polyethylene oxidized				
Polyimide				
Polyisoprene-chlorinated				
Polylactic acid				
Polyoxymethlyene				
Polypropylene				
Polystyrene				
Polysulfone				
Polyvinylchloride				
Rubber type 1				
Rubber type 2				
Rubber type 3				
Acrylonitrile-butadiene				

 Table S4 Spiked recovery of positive control samples (n=6)

Spilzo	Recovery (%)					
эріке	РЕТ	PE	PP	PVC		
Spike 1	0.0	101.4	30.8	11.2		
Spike 2	160.9	110.6	102.1	24.4		
Spike 3	56.4	0.0	38.4	51.3		
Spike 4	29.0	0.0	29.6	0.0		
Spike 5	0.0	0.0	29.0	0.0		
Spike 6	0.0	135.2	95.9	0.0		
Mean	41.1	57.9	54.3	14.5		



**Figure S1** Mean microplastic concentrations as mass in soils with and without sludge application during summer (August 2019) and winter (February 2020) months. Values are logged for visualisation. Error bars are standard error (n=20).



**Figure S2** Principal component analysis including all polymers showing the ordination of treatment groups (biosolids or no biosolids) across summer and winter seasons. An outlier represented by the presence of polyester is outlined in red.



**Figure S3** Photographs of example plastic exposure routes in sampled soils which may result in patchy distribution. A+B) Dark brown patches are 'sludge cake' on top of lighter brown soils. C) Macroplastic from suspected agricultural activity.