

## Comment on soil-2021-70

Anonymous Referee #2

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Referee comment on "Are agricultural plastic covers a source of plastic debris in soil? A first screening study" by Zacharias Steinmetz et al., SOIL Discuss.,  
<https://doi.org/10.5194/soil-2021-70-RC2>, 2021

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The article presents a investigation of soil regarding the occurrence of microplastics. The study is well realised and meaningful information about the methods (including steps of sampling, sample preparation and detection) parameters are given. The results are realistic.

Very welcome is the point, that the authors says, that this is a „first screening“ and not a final result (including a worldwide calculation) for the rest of the world. Therefore I would avoid the deeper comparison to other studies (especially to Dierkes 2019), especially when other techniques were used. Ever through these authors did not interpret their work as a „snapshot“, the goal of this article should be this „first screening“. Furthermore the study should focus on the results and not on the comparison of the methods (Who is the best one?). Therefore, please shortens the text between L. 263-274, nobody needs this „Hunt for the lowest LOD“ any more.

I have some very specific comments that should improve the scientific meaning of the article.

Is there an meaningful reason for separation of particles larger than 2 mm and subsequent analysis using ATR-FTIR or should it be better to go down with the limit value to 0,5 mm for example?

The advantage of the present method (density separation, polymer extraction and detection) in comparison to the method of Dierkes (polymer extraction and detection) is the investigation of a higher field sample volume. Therefore it is expected, to get a more homogeneous, representative result. Did the authors proved this by various loading of sample volume with spiked polymers? Otherwise, please comment this more clearly and highlight this as a advantage from the beginning (not in the conclusion!)

L.84: Please check, if paper bags contain PS signals. PS copolymers are often used for paper stabilisation and might be a source for the unclear PS signals. The reason in L 314 is very speculative and should be deleted, so far this is not documented for the investigated soil.

L.104-110: No data from MS of TGA/MS are presented. Therefore please delete this as an information (just TGA).

L.160-162: No results from measurements using PET, PMMA, PVC, TWD are given. Please delete this information.

L.184: Thermoanalysis include DSC, TGA and also others methods (DMA, Rheology etc.). In this present meaning it is related to DSC. Make this more precise, to avoid misunderstanding.

L.185, 193: Please define what the meaning of degradation onset's means. Include the determination of this value.

L.199, 212: BHT is not a common additive for polymers. It is as a antioxidant to small and tends to migrate from the polymer bulk. The observed signal is probably related to the thermal decomposition product (or because of degradation process) of Irgafos 168 or Irganox 1010, etc.

L.199: please replace slip agent by lubricant, is more common.

L.201-202: The Non-identification of pesticides are very surprisingly: Are they used during the period of agriculture? Or are they expected as a additive in the plastic materials?

L. 215pp: please comment the very intensive signals about 1000 cm<sup>-1</sup> in the ATR-FTIR spectra, which are not related to PE or PP.

L.230pp: The low recovery rate of PS is surprisingly, because PS is the best soluble polymer compared to PE and PP. The explanation in l. 257 is very speculative and needs a approval. I expect, that part of the PS degrades to smaller PS oligomers or monomers, which does not fit to the calibration signals of reference measurements. PS is very sensitive to depolymerisation (Ceiling Temperature!), therefore I expect a significant lost of signals due to degradation during density separation and extraction processes.

L.275pp: Are all measurements using PY-GC/MS realised only once, or are there repetitive measurements at single samples?