SOIL Discussions

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Comment on soil-2021-105

Anonymous Referee #2

Referee comment on "Effects of returning corn straw and fermented corn straw to fields on the soil organic carbon pools and humus composition" by Yifeng Zhang et al., SOIL Discuss., https://doi.org/10.5194/soil-2021-105-RC3, 2022

The paper of Zhang et al. deals with the effect of addition to soil of crop(corn) residues on the soil stable and labile organic C pools. The paper describes the results of a year-round field experiment where differently treated straw (FCS-T, CS) were added to so soil. I do not see great novelty in this work since the positive effect on SOM and SOM pools of the amendment with pre-treated crop residue is well known. The fermentation with Tricoderma reesei substantially mimed a composting effect, producing a material partly degraded and enriched of stable molecules. This fact, evidently favors both the SOM accumulation and production of labile substances from the portion not completely stabilized. This effect could be explored in future by testing different fermentation periods that should produce material with different stability.
The introduction is not very well informative about the study presented and, further, in some parts it has a textbook-style, which should be avoided in a research paper. The authors have to do a greater effort in displaying the state of the art in the recycling of crop residue as soil amendments and presenting their own hypotheses.
I suggest to reduce the use of acronyms that make the paper very hard to follow.
In my opinion the manuscript needs major revision before to be considered for publication.

Here below some specific comments

37-39. This sentence is a partial repetition of that at lines 25-28.

40 Please, add how much time passed between the application of the straw and the determination of the C.

41-42. this sentence need references

43 Please, explains what the CPMI index consists of

45-49. This part should be deleted. This information is well known by the soil community

76 The coordinate are not the same from line 69. Please explain why if is the case.

86 please define the mineral salt solution

114-116. how long lasted the shaking time with water?

117 No incubation and fumigation before the MBC extraction? How did you estimate the MBC without the difference between fumigated and not-fumigated samples? The simple extraction with K2SO4 gives you the OM soluble in a K2SO4 solution which has no connection with the microbial C!!

120-122. Here the authors refer to fumigation, but it is not clear. Please xplain better the methodology used. When and how did you fumigate soil during the cultivation period?

138 delete CPMI = CPI â□□x CPAI x 100

146-147. The humification degree (PQ) was calculated as HA-C/HE-C ratio (Sugahara and Inoko, 1981).

220, 221. Barley

239-250. This part describe essentially the effect of addition to soil of pretreated material (e.g. compost).I think that this part does not add very much to the discussion and could be diluted along the section.