

SOIL Discuss., referee comment RC2
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Comment on soil-2021-17

Lukas Kohl (Referee)

Referee comment on "Significant soil degradation is associated with intensive vegetable cropping in a subtropical area: a case study in southwestern China" by Ming Lu et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-17-RC2>, 2021

Lu and co-authors report on a study that investigates the impact of transition that conventional rice paddy/oilseed rape to vegetable cultivation has on soil properties. They report that increased over-fertilization and decreased organic matter inputs lead to nutrient accumulation and organic matter depletion in subtropical agricultural soils.

This is an important and timely study that fits well into the SOIL journal. The authors do not provide sufficient details on the methods to provide a full judgement on the validity of their results, but my overall impression is that their conclusions are well supported by the data. The manuscript is written in technically correct English, but I think that some sections need to be substantially improved before publication (see below). I therefore think that the authors should be given the chance to substantially improve the manuscript before publication (major revision or rejection with invitation to resubmit).

Specifically, I think that the quality of the different section of the manuscript varies a lot. In my opinion, the results and discussion sections are well developed and can be published with little modification, whereas introduction and methods sections need substantial improvement. The introduction is very short and does not provide a full overview about what is known about crop-to-vegetable transition impacts on soils. The text also misses 'flow' from one paragraph to the next. I would recommend to broaden the introduction, and look at crop-to-vegetable-transitions studies conducted throughout various climate systems. In addition, the introduction could explain how the different parameters measured are affected by this transition, and what results are therefore expected. In the methods section, a lot more detail needs to be provided with regards to data sources and analytical methods.

I have one major scientific concern that should be addressed by the authors. The manuscript states that soil properties of fields converted to vegetable farming were similar to those retained in conventional crop rotation. I think this authors need to provide more evidence for this point as it is an essential condition for the validity of their findings. In particular, I am wondering if the authors have any information whether the fields that were transitioned from conventional to vegetable farming were chosen randomly, or if farmers took soil properties into consideration when deciding if a given field was converted or not. If the latter were the case, the initial conditions of these field would be different from those retained in traditional crop rotation, which would limit the authors ability to link difference in soil properties to farming practices. This also applies to effects of time-since-conversion, since the farmer's considerations could change over time.

Minor comments:

L37: per unit nutrient inputs: Specify which unit you refer to (area?)

L64-70: the data presented here should be supported by references.

L81: farmers' survey methodology: I assume this refers to an established survey or similar undertaking, but this is likely lost in the translation, and comes across quite confusingly. I recommend clarifying this.

Section 2.3: A lot more detail is needed here. Ideally, a reference should be provided for each method, along with enough details such that the reader can reproduce the

measurements.

Section 2.4: Here as well more detail needs to be provided. What were the nutrient concentration in each fertilizer, and how were they obtained (source?).

Section 2.5: The use of a two-segment fitted line in Fig 2b is inappropriate because there are only 3 independent datapoints (underlying replicates are not independent of each other). Essentially, this just connects two points with a line in between. I also don't think this contributes to the findings of the paper, so I would recommend removing it. Also, provide an overview on the amount of each fertilizer used in each treatment group.

L152: I assume the unit here should be Mg ha^{-1} instead of $\text{Mg ha}^{-1} \text{ yr}^{-1}$

L196: explain 'extension service'

L207-8 weighted mean: weighted by what?

286-288 check repeated statement.

Table 1 and 2: standard deviation or some other measure variance should be stated along with each value

Fig 2. See comment on segmented fit above. Also, I guess with tillage frequency you mean number of tillages since conversion? It would be simpler to just state number or years since conversion here. You could also add the PRF datapoint to the plot (time since conversion = 0)

Fig 3: Wider bars would make the figure easier to read.

Fig 4: Did you actually calculate the cumulative P surplus for each site, or did you just multiply the average surplus with the number of years? If the latter, it would be better to just state years since conversion.

Data availability: Raw data should be placed in a publicly available repository to meet the Copernicus/EGU data policy.