



Comment on soil-2021-17

Anonymous Referee #3

Referee comment on "Significant soil degradation is associated with intensive vegetable cropping in subtropical area: A case study in southwest China" by Ming Lu et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-17-RC3>, 2021

Significant soil degradation is associated with intensive vegetable cropping in subtropical area: A case study in southwest China

The present study intends to assess the effects over time of conversion from paddy rice-oilseed rape rotation (PRF) to vegetables (VF) cropping on soil organic carbon, total nitrogen, pH and nutrients considered as soil quality parameters. The subject fall within the general scope of the journal and it is a new and original contribution. In fact, this work provides useful data on soil organic matter within vegetables the cropping systems and confirms that is a sensitive indicator in environment degradation studies relative to land use and is worthy of publication in Soil. However, the manuscript requires major revision to improve the text and clarify some points before being acceptable for publication:

- Introduction section should include a work hypothesis.
- In my opinion, the first objective is encompassed in the second objective because this previous survey is necessary to select the different VF farms according to the time elapsed since the conversion to vegetables as well as to discuss the differences found between both types of crops. In any case, this survey generates a database with little data and regional or local relevance.
- The experimental design is poorly explained, which combined with a poor presentation of statistical results, makes it very difficult to be certain what the researchers actually did. Were used plots randomly set up? For each time since conversion from PRF to VF; were all 12 plots located in the same farm? What is plot size? Where were 12 samples of PRF collected? Adjacent to what? Please add the distance between plots. Thus, information about plots distribution would help.
- Line 92: Why were the soil samples collected in September?
- The effects of type of crop and soil depth on measured variables could be tested by a two-way analysis of variance. This statistical analysis could support the discussion about the differences along soil depth detected between PRF and VF crops.
- Please, provide information about methodology followed for analysing soil parameters.

- Line 88: "To investigate the effects of long-term fertilization...." This is not correct because the soil samples were collected also from VF crops that were converted from PRF 1-3 years and 5-10 years.
- For the measurement of SOC following the dichromate digestion method soil samples are sieved to 2 mm and ground to a power-like consistency. However, the authors used soil samples passed through a 0.15 mm sieve for SOC and TN analyses, which prevents the comparison with other studies.
- Lines 154-156: Could you please add some more information in Mat & Meth. about tillage operations (e.g type of machinery, tillage depth, tillage timing)? a better description may help to support the suggestions made by the authors about the effects of tillage practices on soil organic carbon.
- Line 117: the authors state that the accumulation of P surplus was calculated as the annual P surplus multiplied by planting duration. I guess that they meant that annual P surplus was multiplied by years since conversion to vegetable cultivation. This should be clarified.
- Expressions like 1.92 or 0.80 mg P kg⁻¹ (see abstract and through text) must be arranged by keeping the homogeneity of significant figures that your equipment generates. What is the precision of your method? Probably significant figures are "out" of the precision of your method!
- Some confusing sentences. What do the author's mean by "farmers' survey methodology" or "local extension service"?
- Lines 150-151: Where are the data of bulk density in the manuscript?
- Lines 212-221: This topic is not addressed in this study. Then, I suggest deleting it.
- Lines 286-288: These two sentences are repetitive. One sentence should be deleted.
- The variance of data presented in Tables 1 and 2 should be expressed using standard deviation or standard error.
- What data are shown in Table 1? Are average values of 36 surveys related to VF management?
- Lines 165-166: The authors state that for every 100 kg ha⁻¹ of P surplus in the VF, AP concentration in the 0-20 cm soil layer increased by 1.92 mg kg⁻¹. However, according to the equation obtained by the authors for the data of the Figure 4 ($y = 19.234 X + 43.257$), for 100 kg ha⁻¹ of P surplus in the VF, AP concentration in the 0-20 cm would increase by 45 mg kg⁻¹.
- Lines 235-246: This topic is not addressed in this study. Then, I suggest deleting it.
- Lines 255-258: In relation to inorganic N losses, the ammonium fixing capacity of the soils used (Ultisol) should be mentioned.
- Line 266 (P enrichment): It has been omitted that when the soil pH reaches values less than 5.3 as occurred by conversion to VF, the presence of Al and Fe in clay minerals of Ultisols can contribute to fixing process of P.
- The English of the manuscript needs to be revised. They erroneously interchanged the term P surplus by surplus P throughout the text. For example, the authors write "the

accumulation of surplus P" in the caption of Figure 4, whereas the title of x they write "accumulation of P surplus".