Point-by-Point Response (in italic) to Reviewer's Comments

Title: Status and influential factors of soil nutrients and acidification in Chinese tea plantations

MS No.: egusphere-2024-2498

Note: all the revised parts have been highlighted in blue in the revised manuscript.

Overall comment

Wang et al. reviewed the status and influential factors of soil nutrients and acidification in Chinese tea plantations. Overall, this is an interesting and useful study. The methods employed for data collection and analysis are robust. I have a few comments that may enhance the quality of the paper:

Response: Thank you very much for the positive comments and invaluable suggestions. The manuscript has been revised accordingly.

Comment 1

The authors propose several effective management practices. However, there are trade-offs between fine management and costs. I strongly recommend conducting a brief economic analysis, or at the very least, including a discussion on whether the benefits of these practices outweigh the associated costs.

Response 1 : Many thanks for your suggestion. Assessing trade-offs between fine management and cost can be conducted from a life cycle perspective. The processes and results of life cycle cost analysis will be another story of the performance of tea plantations. Besides, the cost of fine management is influenced by the market of products, price of materials, fertilizes and labour, which are varied among regions due to the variations of economic development, society and culture among regions. It's difficult to unified at national level. Therefore, we added a paragraph to discuss the trade-offs between fine management and costs and the achievements of both environmental and economic sustainability. Details refer to the added section 4.4.

Comment 2

L16: Please specify why you use data pairs. What are the two components that you are comparing?

Response 1 : Many thanks for your comments. In this study, multiple indicators (e.g. AN, AP, AK, TN, TP, SOC, etc.), geological and climatic factors and management practices were recorded in the database to evaluate the status and influential factors of soil nutrients and acidification, therefore, there were several values within a data group. So we used data pairs. After checking the meaning of "data pairs" and "datasets", We misused them in the original manuscript and changed "data pairs" to "datasets" in the revised manuscript.

Comment 3

L19: What is the difference between geolocation and location?

Response 1 : Many thanks for your comment. In this study, we used longitude, latitude and elevation as geographic factors influencing soil nutrients, so “geolocation” was used to highlight the geographical position of study sites. We checked the meaning of “geolocation” and “location”, and there seems no difference. So we changed “geolocation” to “location” in the revised manuscript.

Comment 4

L20: Please specify how you calculated the stoichiometric ratios, e.g., C:N, C:P...

Response 1 : Many thanks for your suggestion. In this study, the stoichiometric ratios were calculated in mass of SOC, TN, TP and TK for the consistency and comparability with other meta analyses researches and the literature where we collected data. We also indicated this in the revised manuscript.

Comment 5

L21: Perhaps consider deleting "life"?

Response 1 : Many thanks for your suggestion. The word “life” was deleted, same expressions in the main text were also revised.

Comment 6

L52: soil pH rather than soil pHs.

Response 1 : Many thanks for your suggestion. The mistakes were corrected.

Comment 7

L108: This is printed in Chinese. For the soil types mentioned in this study, could you please add a brief comparison table of the Chinese classification and the international classification, e.g., WRB?

Response 1 : Many thanks for your suggestion. The explanation of why we adopted Chinese soil classification system and a table comparing the soil classification systems were added in the revised manuscript.

Comment 8

L. 130: Is there a composite index that assigns different weights to various indicators?

Response 1 : Many thanks for your comments. All the indictors of soil nutrients were assumed to share the same importance according to literature.

Comment 9

L220: Large C stock does not necessarily mean a large C sequestration capacity. This does not make sense. Please delete.

Response 1 : Many thanks for your comments and suggestion. We claimed the large C sequestration capacity in Chinese tea plantations because of the wide range of SOC concentrations rather than its high SOC concentrations. This might lead controversy. Therefore, we delete this expression in the revised manuscript.

Comment 10

L250: Please specify in what context did Yan et al., (2020) reported the value 4.68.

Response 1 : Many thanks for your comment and suggestion. Yan reported the soil pH in tea plantations in China at the national level. We mention this in the introduction in both original and revised manuscript. We also added more details about the number of datasets and sources and coverage of study areas in the revised introduction.

Comment 11

L261: I suggest checking the soil parent material. Is it possible that carbonate rocks contributed to the high pH values?

Response 1 : Many thanks for your suggestion. We checked the distribution of soil parent material in China and the their influence on soil pH. We found that soils developed from limestone and river alluvium often exhibit high pH (>7). And theses soil parent materials are widely distributed in north and south Yangtze zones. We added these arguments in the revised manuscript as well.