

## General Comments

This study focuses on a subtropical tea plantation and utilizes the static chamber-gas chromatography method to conduct long-term monitoring of CO<sub>2</sub> emission fluxes under different green manure intercropping treatments. It systematically reveals the short- and long-term trends and differences in CO<sub>2</sub> fluxes across different areas of the tea garden, including between tea rows, and analyzes the impact of key environmental drivers such as soil temperature, moisture, and organic carbon on carbon emissions. The findings provide important insights into the carbon cycling mechanisms in tea plantations under green manure intercropping and hold significant practical value for promoting low-carbon management in tea cultivation. The experimental design is reasonable, the analysis and discussion are thorough, and the structure is clear, making the paper suitable for publication in this journal. The following minor revisions are recommended:

1. Lines 153–154: The baseline physicochemical properties of the soil in the study area are not provided. It is recommended to include initial soil characteristics.
2. Line 171: In addition to the green manure treatment, please specify the type and application rate of fertilizers used.
3. Line 185: For consistency, please express time in 24-hour format. Replace “between 9:00 and 11:00 a.m.” with “between 09:00 and 11:00 (local time).”
4. Line 198: What was the soil sampling depth? This significantly influences soil physicochemical properties. Sampling across multiple soil layers would be more appropriate.
5. Lines 216–217: The method for calculating CO<sub>2</sub> fluxes is not clearly described. Please provide details.
6. Lines 308–310: On what basis were the growth stages of green manure defined? Please clarify.
7. Lines 498–499: The decrease in cumulative emissions between rows in the second year is attributed to “reduced human disturbance,” which is insufficiently supported. Please elaborate with references to relevant literature.
8. Line 541: The discussion on the SOC threshold lacks adequate references. Additional literature should be cited and discussed.
9. Table 1: Please clearly note “Values are mean  $\pm$  SE” in the table caption or footnote.
10. Root biomass data are lacking. The contribution of green manure roots to soil respiration has not been quantified, which may affect the interpretation of CO<sub>2</sub> flux sources.
11. Within the closed chamber environment, temperature and humidity change over time, potentially influencing CO<sub>2</sub> flux measurements. Further analysis on this aspect is recommended.
12. The study does not explore how different green manure treatments regulate microbial activity or the mechanisms by which soil microbial communities drive carbon sequestration. If relevant measurements were not included, this could be addressed in future research.
13. The language throughout the manuscript should be further refined to avoid repetitive statements, particularly in the Results and Discussion sections.