List of responses

Dear Editor and Reviewers:

Thank you for the reviewers' comments concerning our manuscript entitled "Moderate N fertilizer reduction with straw return modulates ecosystem services and microbial traits in a meadow soil" (Manuscript ID No. egusphere-2023-2498). These comments were all valuable for improving our manuscript and provided important guidance for our research. We have studied the comments carefully and have made corrections that we hope will meet with your approval. The main corrections in the paper and the responses to the reviewer's comments are as follows:

The authors revealed the effects of N fertilizer reduction on soil ecosystem services under straw-return conditions from exogenous inputs and microbial perspectives, as well as potential microbial relationships. The work is rewarding, but I have some suggestions that need attention so that I can improve the quality of the manuscript.

1. In my opinion, the N+PK treatment in this work is a regular fertilization practice in the field, so when describing the results, the main description of the results should be "decreasing with the application of N fertilizer" rather than "increasing", and the description of the results is likely to cause confusion to the readers.

Reply: Thank you for the comment. We have revised these sentences.

Regarding greenhouse gas emissions, with decreasing N fertilizer application levels, CO2 and N2O emissions gradually decreased. (Lines 308-309)

2. Lines 83-106, try to reduce this section, too long a description leads to less readability.

Reply: Thank you for the comment. We have reduced this section.

3. Lines 138-141, I think the author has made a writing error here. The text describes 4 treatments instead of 5.

Reply: Thank you for the comment. We have revised the text.

A randomized complete block design consisting of 4 treatments with 3 replications was adopted. (Lines 125-126)

4. Lines 187-213, this section needs to be supplemented with the necessary references.

Reply: Thank you for the comment. We have added the necessary references.

5. Lines 551-563, I think this section is a description of Fig. 6, however there is no discussion of specific microbial species within module communities, please add content.

Reply: Thank you for the comment. We have added relevant content.

The *Lasiosphaeriaceae*-driven module 1 and *Terrimonas*-driven module 3 communities may be involved in maintaining soil ecosystem multifunctionality. (Lines 566-567)

This is an interesting manuscript that could be accepted and published, after revising the above issues.

Thank you for your valuable comments. We hope our responses will meet with your approval.