

January 31, 2026

Prof. Dr. Maria Jesus Gutierrez Gines
Editor,
Soil

Manuscript ID: EGUSPHERE-2025-4852

Subject: Resubmission of revised manuscript (R2)

Dear Prof. Maria,

On behalf of all authors, I am pleased to submit the revised version (R2) of our manuscript entitled: **“Comparative Impact of Bio-Organic and Inorganic Fertilizer Application on Soil Health, Grain Quality and Yield Stability in Nutrient Deficient Regions”**, Manuscript ID: EGUSPHERE-2025-4852.

We sincerely thank you and the reviewers for the constructive and insightful comments, which have greatly helped us to improve the quality, clarity, and scientific rigor of our manuscript.

In the revised version, we have carefully addressed all reviewers' comments point by point. The revisions include improvements in the Results and Discussion sections, clarification of the experimental rationale, enhanced interpretation of findings, and language polishing throughout the manuscript. All changes made in response to the reviewers' suggestions have been clearly highlighted in the revised manuscript, and a detailed response to reviewers' comments has been provided for your convenience.

Thank you very much for your time and consideration. We look forward to your favorable response.

Following is the point-by-point response to the reviewers' comments.

Reviewer 1:

Comment: I am satisfied with the comments addressed by the authors previously and recommend the article in present form.

Response: *We sincerely thank the reviewer for their positive evaluation and for confirming that the previous comments have been satisfactorily addressed. We greatly appreciate the reviewer's time and constructive feedback, which helped improve the quality of the manuscript.*

Reviewer 2:

Comment: The authors conducted two field trials to compare ten Zn-supply strategies for wheat. The integrated treatment consistently increased grain yield, grain Zn, soil organic matter and microbial biomass carbon/nitrogen versus unfertilised control. Economic analysis showed the application of microbial-assisted zinc-enriched compost showed a significant increase in net income. The paper concludes that microbially-activated, Zn-enriched compost is a scalable, eco-friendly option for Zn-biofortification in nutrient-deficient arid soils.

Response: *We sincerely thank the reviewer for their careful evaluation, insightful comments, and constructive suggestions, which have significantly helped us improve the clarity, novelty, and practical relevance of the manuscript. All comments have been addressed point by point, and relevant explanations, comparisons, and literature support have been incorporated. Detailed responses are provided below.*

Comment: The innovation of the article and the previous research is not described in the article. Compared with the author's previous research, this paper only conducted field experiments, and some differences and problems in practical application were not put forward and analyzed, such as the comparison of fertilization during conventional farming and the experimental group. There are still some problems in this paper, such as the analysis of the experimental group is not detailed enough, and some views are not comprehensive enough. These problems need to be further explained according to the existing literature.

Response: *We appreciate this important observation. The novelty and innovation of the present study have now been explicitly clarified in the Introduction by distinguishing this work from our previous research. Unlike earlier single-site or researcher-managed experiments, the present study validates microbial-assisted Zn-enriched compost under real farmer-field conditions at two arid locations, integrating agronomic, soil biological, and economic analyses relative to farmers' conventional practices. This clarification strengthens the manuscript's contribution toward scalability and real-world adoption.*

1. Introduction

Comment: It is suggested to supplement and focus on describing the innovation points in the practical application of this research compared with the previous research and compare the data analysis.

Response: Line 90-97; *The Introduction has been strengthened by explicitly highlighting:*

- *Field validation under farmer-managed conditions*
- *Comparison with farmers' conventional fertilization (control)*
- *Inclusion of economic analysis and yield stability across locations*
- *Integration of soil biological indicators with agronomic outcomes*

Comment: It is suggested to supplement the literature analysis on “the use of bioactivated Zn-enriched compost in arid regions remains underexplored.”

Response: Line 78-84; *This suggestion has been addressed by expanding the literature review and adding recent studies emphasizing the scarcity of field-scale evidence in arid regions.*

2. Materials and methods

Comment: The paper does not mention the impact of farmers' self-fertilization in the conventional state of farmland. This group should also be added to the calculation of economic effect for comparison, so as to be close to the actual production.

Response: *We thank the reviewer for this valuable suggestion. The control treatment (T0) already represents farmers' conventional fertilization practices, including recommended NPK inputs typically applied in the region. This has now been explicitly clarified in both the Field Trial (Line 162-166) and Economic Analysis (Line 253-256) sections to avoid ambiguity.*

3. Results

Comment: In the chapter of calculating economic effects, in addition to the impact of farmers' self-fertilization mentioned above, the final ratio in the market source of zinc group is almost the same as that in the control group. Is this group appropriate? Should other groups be selected to better support the research results?

Response: Line 424-428; *Yes, the ZnSO₄ group is appropriate and intentionally included. Its similarity to the control in economic returns highlights a key finding: the limited profitability of conventional Zn fertilization under arid soil conditions due to Zn fixation and low nutrient use*

efficiency. This strengthens the argument for microbial-assisted Zn-enriched compost rather than weakening it.

4. Discussion

Comment: It is recommended to check the terminology of the article and unify the wording and abbreviations.

Response: *All abbreviations and terminology have been carefully reviewed and standardized throughout the manuscript.*

Comment: It is suggested to increase the analysis of the impact of long-term input of flora and compost on Soil and crop yield, so as to show the reliability of the research results in practical application.

Response: *Line 478-486; Although the present study was short-term, we have expanded the Discussion by integrating long-term evidence from existing literature to support the reliability and sustainability of the findings.*

With best regards

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