

Dear Luis Merino-Martín,

Thank you for your constructive feedback on our revised manuscript. We appreciate the careful evaluation and the opportunity to further improve the methodological coherence and discussion. Below, we address each of your suggestions point by point. All modifications in the revised manuscript are highlighted in **bold** for ease of identification.

#### **Comment 1: Define FERTBIO in the abstract**

**Editor's comment:** *"Please define FERTBIO (Soil Fertility and Biology) in the abstract as it is for the other methods."*

**Response:** We have revised the abstract to include a clear definition of the FERTBIO approach, consistent with the definitions provided for the other methods. The revised sentence now reads:

"...Soil Fertility and Biology approach (FERTBIO), based on the Soil Bioanalysis framework..."

This definition was already incorporated in the previous revision and remains in the current version of the abstract.

#### **Comment 2: Align Discussion conclusions with the experimental design**

**Editor's comment:** *"The Discussion should more explicitly align its conclusions with the study's experimental design. Each treatment (NT and NT+T) is represented by a single mega-plot and comparisons between them must be interpreted as site-specific observations rather than replicated treatment effects. Thus, reducing causal treatment inference (terraces vs. no-till) and framing the results as patterns observed in this particular field comparison will ensure that the interpretations remain consistent with the level of replication."*

**Response:** We fully agree with this important observation. We have carefully revised the Discussion and Conclusions sections to ensure that interpretations are framed as site-specific observations rather than replicated treatment effects. The specific changes are detailed below:

**(a)** Throughout the Discussion, we replaced references to "treatments" with "management conditions" or "field management conditions" to avoid implying experimental replication. For example:

- "the biological index was the most sensitive in detecting differences **between the two field management conditions**" (Discussion, sensitivity paragraph)

- "The only index that consistently captured differences between **the two management conditions**" (Discussion, SHI performance paragraph)
- "the biological indicators had already shown greater sensitivity in differentiating **the management conditions**" (Discussion, sensitivity paragraph)

**(b)** We replaced causal language with associative framing throughout the Discussion:

- "" was replaced by "**being associated with higher soil health values for the no-till with terraces plot**"
- "" was replaced by "**in this field comparison**"
- "soil health crop performance" was replaced by "the **association between** soil health **and** crop performance **in this field comparison**"

**(c)** We replaced "system" with "plot" or "field comparison" where appropriate to reinforce the site-specific nature of the observations:

- "maize productivity (...) were higher **under** the no-till with terraces **plot**" (Discussion, productivity paragraph)

**(d)** In the Conclusions section, similar adjustments were made:

- "Four soil health approaches were evaluated **in a field comparison of** no-till systems with and without agricultural terraces"
- "the no-till with terraces **plot was associated with** higher maize productivity"
- "showing gradual **alignment** over the years **under these management conditions**"

**(e)** We strengthened the existing acknowledgement paragraph by adding an explicit statement:

"Accordingly, the patterns described should be interpreted as observations from this particular field comparison rather than as generalizable treatment effects."

We believe these revisions ensure that the interpretations remain consistent with the level of replication, while preserving the important insights regarding temporal trends and the relative sensitivity of the different soil health indices.

**(f)** In addition, Figure 6 was replaced with a revised version to improve visual clarity and enhance color contrast, thereby facilitating the interpretation of the results.

**Comment 3: Consistent structure in reviewer responses**

**Editor's comment:** *"For future submissions, I recommend maintaining a fully consistent structure when replying to reviewers; in the current response, some reviewer comments are quoted explicitly while others are not, and including each comment (or a concise summary of it) before the corresponding response would greatly enhance clarity."*

**Response:** We sincerely appreciate this recommendation. We have taken note of this guidance and will ensure that all future responses to reviewers follow a fully consistent structure, with each reviewer comment (or a concise summary) explicitly quoted before the corresponding response, as exemplified in the present letter.

We hope that these revisions satisfactorily address all of the Editor's suggestions. We are grateful for the constructive feedback, which has strengthened the manuscript. We remain available for any further revisions that may be needed. In addition, we have addressed the technical requirements raised during the submission process, including revising the short summary to remove abbreviations and adding a dedicated "Code and data availability" section.

Sincerely,

Ariane Lentice de Paula, on behalf of all authors