

Dr. Elizabeth Bach  
Topical Editor  
SOIL

Dear Editor,

Re: Manuscript soil-2020-2 “Relations between mineralized N delivered by soil food web and soybean yield after long-term application of conservation tillage system in a black soil of Northeast China (soil-2020-2)” Shixiu Zhang et al.

Thank you very much for your careful review and constructive suggestions with regard to our manuscript. We sincerely appreciate the Editor’s and Reviewer’s thorough reviews and helpful suggestions.

I am sending here one copy of our revised manuscript, with the revised portion marked in bright red and double lines for the convenience of tracking the modification. The responses to the reviewer’s and editor’s comments are listed as appendix behind this letter. Please note that the title above is that of the original submission. As part of the revision, we have changed the title to “Complex soil food-web enhances the association between N mineralization and soybean yield: A model study from long-term application of conservation tillage system in a black soil of Northeast China”.

We believe that we have addressed all of the Editor’s and Reviewer’s comments and that manuscript has been improved satisfactorily. We hope it will meet your approval.

Yours sincerely,

Dr. Shixiu Zhang

Comments from the Editor and Reviewer are in black and our responses are marked in blue. The line references in our responses refer to the line numbers in the revised manuscript.

### **Editor**

1. Must address caveats pertaining to 1 year of data.

Thanks for your suggestion. We added the caveats of 1 year of data collection in the lines 415-419 of the revised manuscript.

2. Must clearly present as a modeling study that sets-up hypotheses for future studies to test, not as empirical data. The final sentence of the conclusion (lines 530-535) does this, but it needs to be evident in the abstract, the results, and early in the discussion.

In order to highlight the goal of 'present study is acted as a modelling study not as empirical data', we revised some places in the abstract, the results, and early in the discussion according to the suggestions. The detailed revised places were in lines 55-59 (abstract), 357, 359, 390 (results), 415-419 and 546-548 (discussion) of the revised manuscript. Furthermore, we also revised the title (lines 7-10) to make it more in line with this goal.

There is lingering confusion about the relationship of these results to soybean yield. The title and paper clearly tie the soil food web modeling to soybean yield, yet in response to reviewer 2, it is stated "Our study was focused on investigating how the whole soil organism communities regulate nutrient cycle impacting crop growth not on the variation in crop yield among different tillage practices." There is a subtle difference in soil community contribution to crop growth vs. tillage differences in crop yield. Crop growth was not measured in this study, yield was, and the paper repeatedly ties the results back to soy yield and tillage practice.

I am very sorry for the misunderstanding caused by the unclear expression. The focus of this study is indeed to investigate the relationship between N mineralization mediated by soil organisms and soybean yield after long-term application of conservation tillage. Although the N mineralization within soil food web and soybean yield were both presented in this study, more attention was put on the simulation of N mineralization within the whole food web rather than put on the soybean yield. This is primarily because that we want to test the importance of soil food complexity in affecting crop yield through mediating nutrient cycling.

We agree that 'crop growth' and 'crop yield' refer to different content. So, in order to be clear to readers and avoid any confusion, the term 'crop growth' was deleted throughout the revised manuscript.

### **Referee 4**

3. Line 32: Change to "achieve a new equilibrium in the soil environment"

Line 32: the sentence was revised.

4. Lines 34-35: Change to “in such a situation” ... “how the soil community regulates nutrient cycling impacting crop growth is not well documented”

Lines 34-35: the sentence was revised according to reviewer’s suggestion.

5. Lines 36-37: Delete “continuous application”

Line 37: ‘continuous application’ was deleted.

6. Line 39: Delete “pool”

Line 39: ‘pool’ was deleted.

7. Line 40: Change to “plant growth will vary”

Line 41: ‘will’ was added.

8. Lines 44-45: Change to “using energetic food web modeling.”

Lines 45-46: ‘using the food web energetic model’ was replaced by ‘using energetic food web modeling’.

9. Line 47: Change to “A similar trend...”

Line 48: ‘Similar trend’ was replaced by ‘A similar trend...’.

10. Line 56: Should be “potential mineralizable N pool”

Lines 55-57: this sentence was rewritten, so ‘potential mineralizable N pool’ was deleted in the revised manuscript.

11. Lines 56-57: ”which is a cornerstone for conservation tillage system to achieve the sustainable crop productivity” – This sentence fragment needs revising; I’m not sure what you mean here.

Lines 55-59: these sentences were rewritten in the revised manuscript.

12. Line 87: Should be “potential mineralizable N pool”

Lines 90: ‘the potentially mineralizable N pool’ was replaced by ‘potential mineralizable N pool’. The whole context was thoroughly checked, thereby the following places in lines 467 and 535 were also revised in the manuscript.

13. Line 95: Change to “when the soil environment”

Lines 98-99: ‘the’ was added.

14. Line 97: Change to “situations”

Line 100: ‘situation’ was replaced by ‘situations’.

15. Line 105-107: This sentence needs to be revised; hard to understand

Lines 108-110: we rewrote this sentence to make it clear to readers.

16. Line 123: Change to “plant growth will vary”

Line 126: ‘will’ was added.

17. Line 161: Change to “prevent water and wind erosion”

Line 164-165: ‘prevent the water and wind’ was replaced by ‘prevent water and wind erosion’.

18. Line 179-182: I think instead the authors should acknowledge the limitations of data collected in only one year.

Thanks for your suggestion. We acknowledged the limitations of one-year data in lines 415-419 of the revised manuscript.

19. Line 193: Need to close out the sentence with a closing bracket

Line 195: the closing bracket was added.

20. Line 206: Change to “The microbial community”

Line 208: ‘The’ was added.

21. Line 232-234: The arthropods are not extracted at room temperature if there is a heat gradient from the lights. I would delete the phrase “at room temperature” because it is confusing and not the standard language for describing this method.

Line 236: ‘at room temperature’ was deleted.

22. Line 526: Should be “potential mineralizable N pool”

Line 540: ‘potentially’ was replaced by ‘potential’; this terminology has been carefully checked throughout the context to make sure that ‘potential mineralizable N pool’ was consistently used in the revised manuscript.

In addition to the above revisions, we have also made minor revisions where there were grammatical problems or unclear sentences. All revisions were marked with bright red in the revised manuscript.