Dear Editor,

Thank you very much for your and reviewers' efforts on our paper submitted to the "Soil" (Manuscript ID soil-2021-40). We have checked the manuscript and revised it according to the comments carefully. The revision has been highlighted in the document by using colored text. We submit here the revised manuscript as well as an itemized response to reviewers' comments.

Sincerely yours,

Dr. Kaihua Liao

Response to Topical Editor

1. l. 55. always preferentially loses > is always preferentially lost

Answer: Sorry for this error. In the revised manuscript, "always preferentially loses" has been replaced by "is always preferentially lost" (P3L55).

2. l. 65. remained > remains, showed > shown

Answer: In the revised manuscript, "remained" and "showed" have been changed to "remains" and "shown", respectively (P4L65).

3. l. 68. even that there was no correlation between them > that they were not correlated.

Answer: In the revised manuscript, "even that there was no correlation between them" has been replaced by "that they were not correlated" (P4L68).

4. l. 81-82. The hypothesis has been changed but this does not change my initial comment, that the hypothesis has no support. Please state here why this is your hypothesis. Please make sure that the rationale you provide is the logical conclusion of the information presented in the introduction.

Answer: Thank you for your suggestion. In the revised paper, we have supported the hypothesis. Previous studies (e.g., Liu and Wang, 2009; Wang et al., 2014) have

found that the correlation between soil $\delta^{15}N$ and environmental factors was stronger than that for plant, which may be due to the fact that soil samples represented a long-term average for a given location, while plant samples were affected by the microenvironment or the short-term environmental fluctuations. Therefore, we specifically hypothesized that soil $\delta^{15}N$ is a better indicator of ecosystem N cycling than plant $\delta^{15}N$ (P5L81-85).

5. l. 181. has limit > had limited

Answer: In the revised manuscript, “has limit” has been replaced by “had limited” (P9L186).

6. l. 183. Warming treatment > The type of warming treatment

Answer: In the revised manuscript, “Warming treatment” has been replaced by “The type of warming treatment” (P10L188).

7. l. 188. indirectly > indirect

Answer: In the revised manuscript, “indirectly” has been replaced by “indirect” (P10L193).

8. l. 192. the greater the residual > greater residual

Answer: In the revised manuscript, “the greater the residual” has been replaced by “greater residual” (P10L197).

9. l. 197. remove 'who found that'

Answer: In the revised manuscript, we have removed “who found that” (P10L202).

10. l. 202-207. The direct response of d15N to temperature has already been discussed. Instead it should be discussed here why historical temperature (MAT) influences d15N response to warming.

Answer: In the revised manuscript, we have indicated that the warming effect on soil $\delta^{15}N$ was significantly ($p < 0.001$) influenced by altitude, MAT and MAP. Among these, the strongest correlation was observed for MAT. It is possible that soil $\delta^{15}N$ increased with increasing MAT when the MAT exceeded a certain threshold (e.g., 9.8 ^{o}C as proposed by Craine et al. (2015)). In this case, the increase in MAT can enhance the positive effect of experimental warming on soil $\delta^{15}N$. In addition, the MAT can also affect ecosystem N cycle by influencing soil texture. Craine et al. (2015) reported that hot sites had greater clay concentrations than cold sites. As depicted in Fig. 2g, the finer the texture of the soil, the more significant the effect of experimental warming on soil $\delta^{15}N$ (P10L205-213).