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Interactive comment on "Response of soil respiration to nitrogen addition along a degradation gradient in a temperate steppe of northern China" *by* Jinbin Chen et al.

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Dear Referee #3,

Thank you very much for your technical suggestions. We agree with your opinion that the layout that replication of N treatments within a disturbance category is at a single site only (where three sub-plots are treated as replicates) limits the statistical power of the analysis. But our set-up was thorough and convincing just as the referee #1 have evaluated. The same experimental set-up has also used in the previous study (Xu et al 2015). Our study design was based on Xu's work and we have shared the same information about study site and method. We also incorporated the citation of Xu et al 2015 in our study design description.

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Discussion paper

In addition, concerning lower measurement frequency you have mentioned, undoubtedly, high frequent measurements can better represent the whole growing seasons. However, considering the actual experimental designs and weather conditions, it is possible to conduct only one or two times a month for soil respiration measurement. Firstly, we considered 4 disturbance category, among each disturbance category, we also designed 6 fertilization treatments. Based on previous studies on the soil respiration of grassland (Eler et al., 2013; Plestenjak et al., 2012) and field conditions, we selected the fine sunny days and measured Rs between 9:00 and 14:00 in the daytime to minimize the influence of the dynamic changes to respiration. Secondly, our study site lies at the southeast edge of Inner Mongolian Plateau. In May, the ground is still covered with snow and the steppe plants in this region begin to become green until middle June. Moreover, rainfall concentrates from June to August. Based on these practical conditions, we were not able to conduct high frequency measurements and the data from May and June was absent. We will incorporate those into the description of method section to explain the reason for our lower measurement frequency.

References

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