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## ***Interactive comment on “Grazing effects on soil characteristics and vegetation of grassland in northern China” by Z. Wang et al.***

### **Anonymous Referee #2**

Received and published: 28 September 2015

In this study, Wang et al. evaluate the effects of different grazing intensities on soil and vegetation characteristics in a grassland area of Northern China. The manuscript is in general well written and the findings are somewhat interesting. However, there are some inconsistencies that should be addressed before being considered for final publication. Abstract. It is clear and concise and acceptable in its current form. Introduction. The authors provide references of previous studies dealing with different grazing intensities but these are very general. For example, in page 2285 from line 17 to 19, the authors state that ‘the effects of livestock grazing on soil heterogeneity have not been consistent with some studies showing that overgrazing increased soil heterogeneity’. But what do you mean with ‘soil heterogeneity’ here? Again in this page from lines 20–24 the authors discuss spatial heterogeneity of vegetation and soil. Please, clarify these concepts. Do you mean spatial heterogeneity of SOC? Total N?

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It's not clear. Methods. Here I have some major concerns. The experimental design is not clearly explained. What is the number of replicates? According to the authors (page 2288) they established a sampling matrix consisting of 126 grids and soil samples were collected from transects along the intersecting points and then they bulked these to composite samples. Although they provide Fig. 2 to support this description, I still fail to understand how they divide the area and the number of samples or replicates. Moreover, they do not provide information of the statistical analysis to establish differences across treatments as well as the post-hoc analysis. Did you use ANOVA? Kruskal Wallis? Please specify. The methods for soil carbon should be explained. Results and Discussion. In Table 1 the authors show data on bulk density but in the methods section there is no explanation of it was determined. Again, there is no indication of the statistical analysis to establish differences across treatments as well as the post-hoc analysis. And the same occurs in Figures 4 and 5 which show grass type and species richness. In Figures 1 and 6, please be consistent with the font type and font size, the figures are not clear and the legends are difficult to read. The discussion is very general. It should focus on the results obtained rather than introducing different concepts (e.g. compactation). Conclusions. This section should highlight your findings in a clear form (bullet points could be considered if needed).

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Interactive comment on Solid Earth Discuss., 7, 2283, 2015.

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