

## ***Interactive comment on “Effects of long-term mowing on the fractions and chemical composition of soil organic matter in a semiarid grassland” by Jiang-Ye et al.***

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Received and published: 3 March 2017

General comments referee 1 and the responses to them from authors:

Grassland sustains the feed for livestock and possesses the second largest C pool following forest. This study characterized the structure and composition of soil organic matter in grassland soils received long-term mowing at different frequency, using the traditional method combined with advanced spectroscopy (<sup>13</sup>C-NMR and FTIR) techniques. The results revealed that the medium-frequency mowing could significantly enhance the SOM accumulation and increased the stability of SOM while high-frequency mowing (twice a year) went contrarily. The findings are interesting considering the ecological function of grassland as important C pool and their service function for livestock,

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and of significance to guide the grassland management. The study is conducted well and the paper is clearly presented, while English in some sentences could be further polished (like line 13, line 175 etc.), and the significance of the finding could be further highlighted.

Authors: Thanks a lot for your valuable comments. We have asked the English native speaker (Prof. Di) to seriously edit the MS thoroughly to improve the English language. The introduction and discussion were majorly revised to further highlight the significance of the findings, please see these two parts of MS.

Specific comments referee 2 and the responses to them from authors:

1. The information on treatments detail in Table 1 could be included in Table 3, and Table 1 is not necessary

Authors: We have deleted the Table 1 and the corresponding contents is removed to the experimental design part of the MS. Please see P3, L86 – 88.

2. The measurements for different parameters of SOM in this study were conducted only for one sampling time point. Supplying some annual regular investigation data such as SOC content etc. will be helpful to solidify the conclusion of the study.

Authors: Although the field trial has been started since 2001, the program supported our study began in Sep., 2013 when we conducted this study based on the long-term trial. The sampling time was decided properly to evaluate the impacts of different mowing practices on the stability of SOM by analyzing the differences between the mowing treatments and CK (unmown). To avoid the influences of grass, we chose to collect soil samples in Oct. Therefore, we did not show the investigation data at other time point in this study. However, we measured the MBC and SOC contents and the chemical composition of SOM in the soil samples collected in Oct., 2014, which showed the similar results. Given that we had not measured the contents of other SOM fractions (WSOC, ROC, MHA and CaHA), we did not show the data in this study.

C2

