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Interactive comment on "Effects of mowing on N_2O emission from a temperate grassland in Inner Mongolia, Northern China" *by* L. Zhang et al.

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Interactive comment on "Effects of mowing on N2O emission from a temperate grassland in Inner Mongolia, Northern China" by L. Zhang et al. Anonymous Referee #2 Received and published: 14 January 2014

The manuscript is well structured and within the scope of BG. The topic is interesting but the authors have more work to do. The main drawback is that the authors jumped to strong conclusions that were not supported by observation. I decline the major conclusion mostly due to low frequency measurement.

Response: Thanks for your constructive comments. We generally accepted your opinions and revised the related conclusions throughout the manuscript.

P19220 L14-15 Is the effect significant? Please give p value.

Response: Yes, $p<0.05$ and it was added in the revision.

L16-17 Pay attention to the statement. A significant co-relationship does not have to indicate an underlying driver.

Response: We changed the "a significant co-relationship" to "our results" in our revision.

I do not accept the co-relation between N2O flux and MBN i.e. Fig. 4b. Obviously the series of MBN do not follow normal distribution meaning the frequency of measurement is not high enough to catch the variations in MBN.

Response: Thanks for the comments. We deleted the co-relation between N2O flux and MNB in Fig.4 in the revision.

L18-19 Considering soil temperature in such narrow variations (could be systematic error), I do not accept the co-relation between N2O flux and other factors i.e. Fig. 4f.

Response: These soil temperatures presented here are means of July and August, respectively, and only for reference. However, we agree with you that it is problematic for Fig. 4f plotted using partial data of total N, therefore deleted the co-relation of Fig.4f in our revision.

L20-25 The authors need to highlight the N2O mitigation is valid during the growing season. However, before jumping to this strong conclusion the authors have to discuss the uncertainty of low frequency N2O flux measurement.

Response: Revised.

P19222 L22-24 The authors do not need to hypothesize that N2O flux is affected by both soil biotic and abiotic factors. This makes no sense. Is there any other factors?

Response: Yes, it is a common sense that both soil biotic and abiotic factors affect the

N2O fluxes, which have been documented by many references. However, the extent of the effects may vary from one circumstance to another circumstance. Therefore, it is necessary to retest biotic and abiotic effects on the N2O fluxes in the mowing grassland.

P19224 L22-23 I do not understand the word “biweekly”. Does it mean twice a week or once two weeks? Either case, the authors have to discuss the uncertainty in N2O flux induced by low frequency measurement that may overthrow the major conclusions.

Response: It means once two weeks. We revised the sentence by replacing “biweekly” with “once two weeks”. And we discussed the uncertainties in cumulative N2O fluxes induced by low frequency and other factors in the section of discussion in our revision.

P19227 L15 Here and throughout the text, could the authors give a simple value rather than “data not shown”?

Response: We are sorry about that. However, we can not show these data currently, because those data measured by another group, and nobody else can use them before they were published according to our data sharing policy. And we think the effect of those data is minimum for understanding the N2O flux here.

P19232 L10-13 I do not follow the authors here. In fact I do not understand Fig. 5. L20-21 I do not get the authors’ point here. Relationship between N2O flux and soil moisture is not a big discovery. I do not approve that the authors focus on Fig. 4a and, perhaps, Fig.5 which I do not understand exactly. The manuscript deals with the effect of mowing and also soil moisture on N2O flux, while the effect of mowing on soil moisture is not clear (P19226 L20-21). Why is that?

Response: We agree with you that relationship between N2O flux and soil moisture is not a big discovery. In the revision, we focus on the effect of mowing heights on N2O flux. We revised the captions of fig.4 and Fig. 5, hopefully, it is helpful for understanding the figues and P19232 L10-13. For L20-21, we revised the sentence to “ in addition,

our finding confirm that soil moisture still played a key role in the seasonal cumulative N2O fluxes under mowing.

Interactive comment on Biogeosciences Discuss., 10, 19219, 2013.