

Interactive
Comment

Interactive comment on “Nitrous oxide emission from highland winter wheat field after long-term fertilization” by X. R. Wei et al.

Anonymous Referee #2

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The manuscript addresses the seasonal pattern of N₂O fluxes and annual N₂O emissions from a rain-fed winter wheat field with the different fertilization treatments in the Loess Plateau of China. It seems that the results have been carefully obtained. Since a large number of studies concerning the influence of variation fertilization on N₂O emission from the field crops exist in literature, the MS does not show the novelty which is crucial for a publication in high-ranked journals. However, the results may be important to develop the strategies of fertilization management in wheat crop in the Chinese Loess Plateau for reducing N₂O emission. For this reason, the authors should include the treatment of N₂O emission from the fertilization management of farmer's practice. From the fertilizer treatments (i.e. CK, manure, nitrogen, nitrogen + phosphorus and nitrogen + phosphorus + manure) for a long-term field experiments presented in the MS, I could not see a treatment of farmer's practice. Furthermore, Figure 4 shows that

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there was a great difference in above-ground biomass between 2006/07 and 2007/08. This indicates that the great difference in uptake of nitrogen by plants in both years may also cause the greatly different soil N_{min} in 2006/07 from that in 2007/08 (assuming that there was only one harvest per year). Therefore, data of the soil N_{min} should be presented in the MS as well, which shows total available N in soils. In addition, since it is the quantity of readily available soil organic carbon that is of particular importance for denitrification, the higher total soil organic C may not always show a positive effect of N₂O emission. Thus, the authors should pay attention to the interpretation about effect of the C/N ratios on N₂O emission in this study. For such aspect, the authors should look at the studies on the sources and rates of nitrous oxide emission from grazed grassland after application of ¹⁵N-labelled mineral fertilizer and slurry by Dr. Dittert and his colleagues have been published in the Soil Biology and Biochemistry 38, 2602-2613 (2006) and 37, 1665-1674 (2005). In summary, I suggest that the major revision will be required before the paper could be considered for a publication in the Biogeosciences. Since the necessary data should be added, I am not going to give the specific comments for the current version yet.

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