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Interactive comment on “Responses of N₂O and CH₄ fluxes to fertilizer nitrogen addition rates in an irrigated wheat-maize cropping system in northern China” by C. Liu et al.

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We would like to thank the anonymous reviewer for the constructive comments.

(1) The increased fertilizer rate linearly increased the cumulative N₂O emission in both the wheat and maize seasons. The cumulative CH₄ uptake by the soil tended to be enhanced at higher fertilizer rates (≥ 350 kg N ha⁻¹) in the maize season whereas no effect was observed for the wheat season. We do agree to evaluate the effects of increased fertilizer rate on total CO₂-equivalents of N₂O emission and CH₄ uptake. Basically, the effects of increased fertilizer rate on CH₄ uptake were quite limited. Therefore, the result of optimized fertilizer rate will not be changed. Due to limitation of

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measuring method (opaque chamber method), we can not detect the net ecosystem CO₂ exchange and estimate the effects of increased fertilizer rate on CO₂ exchange.

(2) The current price for urea, wheat and maize are 2150~2350 RMB t⁻¹, 2273~2386 RMB t⁻¹ (water content \leq 12%), and 2222~2339 RMB t⁻¹ (water content \leq 14.5%), respectively, in the research area. We calculated the income for all treatments based on the input of fertilizer and output of crop yield. As compared with the treatment N270, the farmer lost money when the fertilizer rate was above 400 kg N ha⁻¹ for wheat (N850). Except for this case, due to the relatively low price of fertilizer, the farmer always can profit from higher fertilizer rate. That's why we should consider the environmental effects (such as N₂O emission) for the optimized fertilizer management.

(3) We do agree to keep the description consistent in the parts of abstract, results and discussion.

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