



EGUsphere, referee comment RC1
<https://doi.org/10.5194/egusphere-2022-429-RC1>, 2022
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Comment on egusphere-2022-429

Anonymous Referee #1

Referee comment on "Effects of mild alternate wetting and drying irrigation and rice straw application on N₂O emissions in rice cultivation" by Kaikuo Wu et al., EGU Sphere, <https://doi.org/10.5194/egusphere-2022-429-RC1>, 2022

The authors conducted a laboratory pot experiment to investigate the effects of mild alternate wetting and drying (AWD) irrigation and rice straw application on N₂O emissions in rice cultivation through 15N tracer technique. Their results showed that mild AWD irrigation increased cumulative N₂O emissions by 28.8%. Adding rice straw to mild AWD irrigation further stimulated N₂O emissions. These evidences have significance for monitoring N₂O emissions in paddy fields. However, I still have some comments here for the authors to address before it's ready for publication.

For several places, there are something important missing for the authors to have their conclusions.

For example, in abstract L33-36 "mild AWD reduced GWP by 62.9%", but there is neither GWP calculation nor CH₄ data reported, which also lacks CO₂ data.

L39-L42 Since either mild AWD or straw return increased N₂O, it is difficult to directly conclude they are promising agronomic measures to reduce greenhouse effect.

L36-39 "mild AWD irrigation reduced N uptake by rice in the soil and rice aboveground biomass" This is also difficult to directly see the difference from either Fig. 4 or others. We can see adding either urea or straw increased N from N inputs instead of soil, but the difference between CF and AWD should be better presented.

In addition, the description of results was hard to follow. The authors compared their treatments of CK, S, U, U+S in all their figures and tables, but the main conclusion of this experiment was the effects of mild AWD irrigation, so the comparison between CF and mild AWD was often missing for statistics either in the figures or tables.

Finally, language needs improvement throughout the manuscript. For example, nitrogen can be replaced by N after first-time mentioning.

Minor points:

In Abstract, the description of treatments was missing.

L33 Numbers of percentage increase are needed here

L57 reduce water waste and environmental pollution

L65-67 Possible reasons to explain can be introduced here.

L70-72 It seems the balance between CH₄ and N₂O should be emphasized.

L78-81 Way too long containing two which

L95-98 Combine or rephrase the purpose of this study.

L98-101 The hypotheses lack connection between each other

L103-107 2.1 can be combined with 2.2

L184 It is not one-way ANOVA in Table 2, which is three factors instead.

Fig. 1 legend font is too large

L198-202 The difference is dependent on treatments which needs to be specific.

L252-253 No direct evidence is from this experiment in the perspective of microorganisms.

L401-402 Correct "mild AWD irrigation...under mild AWD irrigation"