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Interactive comment on "Revisiting the relationship between soil moisture and N_2O production pathways by measuring $^{15}N_2O$ isotopomers" *by* Kate A. Congreves et al.

Anonymous Referee #2

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Overall the data set is very interesting and will be of interest to readers.

The title uses the word 'revisiting'. While the introductory text notes the relationship between nitrification and denitrification processes with respect to soil moisture there is no prior evidence/studies introduced with respect to isotopomers and soil moisture. Thus the title may require suitable amendment or the introduction requires some additional information.

The introduction is nicely succinct and clear with respect to the problems associated with emissions of N2O, the role of soil moisture as a driver of N2O emissions, and the basics of isotopomers of N2O as linked to nitrification and denitrification. A reference

for terminology used would be good.

In the materials and methods sections: - were the soils sieved? I assume so seeing as they were placed in Petri dishes, thus what was the mesh size? - what was the randomised block design? There are 3 soils and 4 replicates but how many water treatments (WFPS treatments) and what were they? It appears looking at Fig 2 that there are about 16 WFPS treatments. -Note how N2O fluxes were determined. Assume it was just the one gas sample used, so there are I assume assumptions about linearity. - For the Piccaro CRDS is there a maximum/minimum N2O concentration? Were SP effects constant over a range of concentration?

The results and discussion are well considered and it is good the authors have considered N2O reduction effects on SP and interpreted results accordingly. For clarity, in the figure captions please state if the data presented are means or single points etc.

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