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Interactive comment on “The effect of cattle slurry in combination with nitrate and the nitrification inhibitor dicyandiamide on in situ nitrous oxide and dinitrogen emissions” by K. L. McGeough et al.

Anonymous Referee #1

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The manuscript is clearly within journal scope. The manuscript uses ^{15}N isotope to look at the effects of adding slurry to soils, on the emissions and transformations of N pools. Using the data produced the authors have produced sound and clear conclusions using valid and clearly outlined methods. I find the manuscript is very well presented and easy to follow. I have only a few comments as follows.

Abstract L11 “...($\text{N}_2\text{O}/(\text{N}_2\text{O}+\text{N}_2)$)...” L18-20 The statement “...To obtain the maximum...fertilisers.” Is surely a foregone conclusion given that you are dealing with a nitrificationinhibitor that has no effect on NO_3^- . Delete sentence. Rather add a com-

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ment regarding why N₂O emissions were high once NO₃- was there i.e. C source in slurry.

P 9170 Introduction L22 "...in the U.K. and..." L24 "...grassland has declined since the mid 1980s in the U.K. and Ireland by 38 and 33%, respectively. Increasing..."

P9171 L1 "...to use organic fertilisers to supply nitrogen (N) in a nutrient management plan on farms. Cattle slurry is by far..."

P9172 L2 "...in excess of plant..." L12 Ammonium is highly soluble in water too but is not readily leached. A better phrase would be "...DCD carries no ionic charge can be readily leached through the profile..." L27 "...reactive N to the environment, resulting from food and energy production, have been increasing..."

P9173 L5 "...the effects of..." Section 2.1 How soon prior to treatment application was spraying performed. Couldn't this have provided a C supply (the decaying clover etc.) ?

P9174 L5 Insert comma. "...In summary, there..." L13 Delete sentence "Sufficient..." it's obvious. L22 "...determined using an Orion pH...directly using a capillary...chromatograph equipped with a flame..."

P9174 L1/2 "...method by deploying..."

P9177 L17 "...for N₂O and N₂, respectively."

P9179 L23 "...ha⁻¹ (Table 2)." L27 "...other time (Table 2)."

P9180 L22 No, DCD did not significantly increase the values of aD in CSNO₃. Rather, the application of DCD meant the rate of decrease in aD was slower in the CSNO₃. Suggest reword accordingly. L25 Same as above. DCD did not significantly increase the values of aD in NH₄CINO₃. Rather, the application of DCD meant the rate of decrease in aD was slower in the NH₄CINO₃. Suggest reword accordingly.

P9183 L21 "...in both the CSNO₃..."

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P9184 L19 “. . .was predominantly produced by. . .” delete extra use of word ‘produced’.

P9185 L13-15 Delete this sentence it states the obvious.

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