

Interactive comment on “N₂O and N₂ losses from simulated injection of biogas digestate depend mainly on soil texture, moisture and temperature” by Sebastian Rainer Fiedler et al.

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Received and published: 4 July 2017

Dear Sir or Madam

Thank you for your thoughts and recommendations on our manuscript. We follow your doubt that the chosen laboratory design does not allow for a sound evaluation of the risk of injection of BD on field scale N₂O and N₂ losses. In agreement to the other two referees, we have tuned our conclusions to the immediate effects of the investigated factors (soil, amount of BD and WFPS) on gas emissions at the laboratory scale. We omit now the speculations about the overall emissions in field situations and recommend further investigations on this issue.

We suggest our chosen levels of WFPS as rather appropriate since we do not expect a saturation of 100 % WFPS even for the soil surface after precipitation at least for coarse sandy soils as the one we used. However, even if we suggest a wet soil which could reach saturated conditions after additional rain following fertilisation as you prospected, we argue that it is not recommended to use machinery on such wet soils at all. Moreover, the BD is rather not placed into the first few millimetres directly under the surface by injection (we still refer to injection since this technique let us still expect such high concentrations of BD as we applied).

Nevertheless, your point about the sooner or later nitrification of the applied NH_4^+ is reasonable; hence, we added it to the discussion: “However, in field situations, sooner or later an important fraction of this NH_4^+ will be nitrified and can lead to further N_2O and N_2 emissions if the WFPS is at sufficient levels.” (326 – 327)

Yours faithfully

Sebastian Fiedler and co-authors

Interactive comment on SOIL Discuss., <https://doi.org/10.5194/soil-2017-6>, 2017.

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Discussion paper

