

Interactive comment on “Long-term monitoring of nitrate-N transport to drainage from three agricultural clayey till fields” by V. Ernstsens et al.

Anonymous Referee #1

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This paper describes an 11 year field experiment monitoring water and nitrate fluxes in tile drains of three field throughout Denmark. The long monitoring period with detailed nitrate measurements and the combination of discharge, nitrate, fertilizer input, crop growth stages, and agricultural practices make this a very interesting and valuable dataset.

With this dataset the authors aim to provide insight in the important factors that need to be taken into account when legislation of nitrate leaching is scaled-down to the field scale.

In the manuscript the authors meticulously describe their data in clear English, which I appreciate. I thus also have very little comments for this manuscript. However after

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reading the manuscript I'm left with the feeling: "What to do with all this data?". The authors provide no outlook to how this data can be used to down-scale legislation to the field scale. I would appreciate if the authors could provide/speculate on this outlook more. Is it based on these measurements, in their opinion, possible to downscale legislation to the field-site? Or is the variability too large and too complex to come up with sensible field scale target values for N (could we ever make a model that produces sensible/realistic target values?) And how would these target values look like? One annual value for flux or average concentration, or even seasonal values for flux and concentrations? What are alternatives?

Specific comments:

Abstract:

If you put Nitrate leaching data in the abstract I would uses Kg N ha⁻¹ Year⁻¹. This unit can more easily be compared to other sites.

I dont understand line 17 Input had short-term and low intensity drainage?

Page 641 Line 16: outcome of what?

Page 647 You dont report the days with drainage and days with groundwater lower than 2.5m for Faardrup. It is nicer to keep the same format/data for each site.

Page 654 line 23 d?

Page 654 line 25: if you report annual values I think it is best to also use units year⁻¹ to prevent misunderstanding. This throughout your manuscript, figure and tables. I sometimes struggled to find out if fluxes where per year of for the entire period.

Recommended references:

Rozemeijer, J.C., Y Van der Velde, FC Van Geer, MFP Bierkens, HP Broers 2010. Direct measurements of the tile drain and groundwater flow route contributions to surface water contamination: From field-scale concentration patterns in groundwater to

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catchment-scale surface water quality. *Environmental Pollution* 158 (12), 3571-3579

Van der Velde, Y., JC Rozemeijer, GH de Rooij, FC van Geer, HP Broers, 2010. Field-scale measurements for separation of catchment discharge into flow route contributions. *Vadose Zone Journal* 9 (1), 25-35.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 639, 2015.