General Comments

This is a well-written paper addressing scientific questions within the scope of HESS. It reports a study of an experimental treatment of a field in The Netherlands in which the operation of tile drains was restricted except during manure spreading and harvest ("controlled drainage") in order to conserve water. The authors are interested in the effect of this on field hydrology and N and P export (other elements were measured but not reported here). As such the paper addresses an interesting and practically-relevant question. There is a 2-year reference period followed by a 2-year experimental period, though inevitably the meteorology is different. This is an unreplicated experiment, so results must be generalized with caution, though low frequency measurements were made on 3 individual tile drains in the field (showing considerable variation).

The paper presents some novel data and some substantial conclusions are reached. I have however some reservations about the experimental design and whether the conclusions are justified by the data.

The Introduction states "This study aimed at quantifying the effects of controlled drainage on water and nutrient exports from an agricultural field to the surface water" and that they measured "all relevant parameters to assess the complete hydrological and hydrochemical response of the pilot field to the introduction of controlled drainage". They criticise previous studies for failing to quantify "the changes of nutrient export via other flow routes, such as shallow groundwater flow and overland flow". This is a valid criticism, but this study seems to do exactly the same, contrary to the statements above. The only nutrient fluxes reported are from the tile drains. The volume of water arriving in the adjacent ditch other than by the tile drains seems to have been recorded, though it is not reported in the paper. The chemical composition of this water is not reported either, though there are hints that it was measured. So the authors are not in a position to assess the "complete hydrochemical response of the pilot field to the introduction of controlled drainage", as the composition of this water is apparently unknown. Yet this was surely an obvious and interesting question from the start of the experiment. Why build the sheet pile reservoirs otherwise? So I think the authors should either supply some estimate of the composition of this water so they can address the aims of the study, or if unable to do so should modify the aims of the study because the experimental measurements as described cannot achieve those aims stated in the Introduction.

In general, the hydrological conclusions are based more soundly than the hydrochemical ones, and this is reflected in the Abstract, in which the final sentence "did not have clear positive effects" is about all that can be said about the nutrient fluxes.

The paper is entitled "High frequency monitoring of water fluxes and nutrient loads…" and does indeed report some high frequency monitoring. But surprisingly, the high frequency is not exploited to draw any conclusions. Annual means would have done just as well. Yet Fig. 6 shows some intriguing patterns – why do nitrate concentrations increase on imposition of controlled drainage, for instance, whereas P concentrations do not? Any interpretations based on processes must of course be speculative, but the authors could try to generate some hypotheses about what might be happening. The paper would fit much better within the Special Issue if some attempt was made to use the high frequency data, and I would recommend that the authors consider this.

The paper is written in good English, is well-structured and contains few typographical errors. There a good number of appropriate references, showing that the authors know the literature well. There is no supplementary material.

Specific Comments

Abstract	"Controlled drainage" needs to be defined in the Abstract for those unfamiliar with the concept.
6280 l.16	What was the criterion for ionic imbalance (not "unbalance")? e.g. greater than 10% of the total anion concentration?
6280 l.21	"An evaluation of Sorbicells…was published…". The reader here wants to know in a single sentence what the evaluation showed. e.g. did it produce comparable results to grab sampling?
Section 2.2	I found the description of the sampling setup rather confusing, though it becomes clearer on re-reading several times. A diagram as well as the existing photograph would help. I also wonder how the sampling tubes were attached to the ends of the tile drains and whether this significantly affected their hydraulic properties.
Table 1	In Section 2.2, the Reference Period is defined as May 2007 to Dec 2008, and the Controlled Drainage Period as Nov 2009 to Sept 2011. For Table 1, however, the Reference Period suddenly changes to 2 Nov 2007 to 2 April 2008, and the Controlled Drainage period splits into two as Nov 2009 – 2 Apr 2010 and 2 Nov 2010 – 2 Apr 2011. There is no explanation given for this – these periods are certainly when most (but not all) the tile drainage takes place, but why only calculate the water balance for these periods? There may be a reason, but the authors need to justify it.
Table 2	Periods 4 and 5. 944 mm precipitation in 10 weeks sounds more like the mountains of North Wales than the Netherlands! In Table 2, Period 5 (2 December 2009 to 12 Feb 2010) has more rain (944 mm) than the year that includes it (2 Nov 2009 to 2 Nov 2010; 910 mm, Period 2). Similarly Period 4 vs Period 1. The precipitation values for Periods 4 and 5 cannot possibly be correct. The authors need to review the values in this table and supply the correct values, and also review the conclusions drawn from the Table.
Fig.8	In Fig. 8, all the information is duplicated in the two graphs except the nutrient loads, which seems rather extravagant. Why not plot all the information on one graph so the nutrient loads can be more easily compared?

Technical Corrections

p. 6276 l.23	"algal" not "algae"
6279 l.15	"farmer's" not "farmers"
6279 l.17	170 kg N /ha. Is this per year? If not, what is the annual rate?
6279 l.20	"tile drain effluent". Are tile drains the same as tube drains at this site? There has been no mention of tile drains until this point. Best to stick to a consistent terminology throughout.
6279 l.22	What materials were the sheet piles made from?
6280 l.15	"analyze method" should be "analytical method".
6282 l.19	"increases" should be "increased"
6285 l.9	ratios not ratio's. Also in legend to Table 2.
6286 l.14	"reduced" should be "increased"
6286 l.17	needs a hyphen between "oxygen" and "containing"
6286 l.19	"are" should be "were"
6288 l.13	"maybe" should be "may be".
Fig. 1 legend	"Locations of groundwater level recording" – it should say these are the points labelled B1-B7 and D1-D7, as this is not immediately obvious.
Fig. 2	On figure label "Fexible hose" should be "Flexible hose"
Figs 5 and 6	No scale is given for precipitation or discharge.
Fig. 7	No scale for precipitation