

Interactive comment on “Assessment of vadose zone sampling methods for detection of preferential herbicide transport” by N. P. Peranginangin et al.

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We appreciate the helpful and thoughtful comments of the referees and have incorporated them in a revision of the manuscript.

Responses in view of the comments of Referee #1:

Positioning of the manuscript – We have revised the introduction and discussion somewhat to better focus the flow according to the referee’s suggestions, for example, reinforcing that cups, while still heavily used, are readily acknowledged to suffer high variability (Section 1).

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Introduction – The background citations have been streamlined by eliminating a number of intermediate citations, and two newer general reviews have been included (Section 1).

Statistics – Concerning the normality of the distribution of preferential transport parameters: chloride transport parameters were previously found to be normally distributed for both soils, as reported in the already-cited Akhtar 2003b paper. We have added this important consideration to the background soils description (Section 2.2).

Statistics – Regarding the adequacy of three soil coring replicates per site: these corings were only used to measure the soil chloride content, so the concern of Referee 1 for the approach’s adequacy for determining soil herbicide contents is satisfied (Section 2.5).

Preferential flow pathway characteristics – The discussion of an existing citation (Pivetz and Steenhuis 1995) was expanded, and that for a second citation (Stehouwer 1994) added to highlight the multiple effects of macropores on pesticide fate, as opposed to simple flow acceleration. (Section 3.2.1, and a new paragraph in Section 4).

Hyphenated terms for storm frequency – Hyphenated terms (i.e. 10-year, 24-hour) as they appear here are standard, as least as far as used in the original isohyetal maps as well as in the cited Dunn & Leopold source.

Table 3 – The table legend has been reworded to clarify the calculation procedure used (and also corrects an error in the previous version which referred to comparisons of solute concentrations; comparisons were of solute mass collected).

Table 4 – As per Referee 1’s inquiry, mean chloride concentrations were added. The legend and the table heading layout were also clarified to better denote column contents, and the discussion text addressing the table was similarly clarified. A footnote for the Arkport W2 sampler was added to indicate that the peak chloride data shown represented the early peak responsible for the bulk of chloride transport; a much later

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peak had a greater concentration but represented much less mass transport due to very low sample volume.

Figure 1 – Both the web page and printout (from the downloaded PDF) versions of the figure seem to show the sampling lines of concern clearly, so we were unable to determine cause for the faintness of sampling lines indicated by Referee 1.

Figures 2 & 4 – The text “cumulative rain plus irrigation” was added to the figure captions to clarify the intent of “cumulative rain.”

Figure 4 – While rechecking the data for Table 4, we discovered an error in the Arkport wick sampler #2 (W2) chloride plot (which did not affect the discussion or conclusions), which has now been corrected.

Multiple helpful usage corrections suggested by Referee #2 have similarly been incorporated in a number of locations. We clarified that the protective flexible PVC tubing (surrounding the suspended wicks inside the wick samplers) was oversized, thus resulting in very little potential contact between the tubing and the percolate flowing in the wicks (Section 2.3).

We again express our thanks to the referees for their comments.

Revised Tables 3 and 4 as well as corrected Figure 4 are attached as a supplemental PDF.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/6/C3404/2010/hessd-6-C3404-2010-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 7247, 2009.