

Interactive comment on “The effect of changes in rainfall on the response of the water table to a major alley farming experiment” by S. L. Noorduijn et al.

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Dear Reviewer,

On behalf of all co-authors, I would like to thank you very much for providing insightful comments and suggestions on our submission to HESS. We have carefully considered all your comments and we will be including them in the preparation of the revised version of the paper. This is an outline of how we have considered your comments and we would appreciate any additional comments or suggestions that you may have to help us in the preparation of the revised version:

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(1) Manuscript Title To benefit the reader, it may be appropriate to change the title of this manuscript to “Relative impact of key drivers on the response of the water table to a major alley farming experiment”

(2) Observed season fluctuation versus modelled results The annual fluctuation referred to in this section of the manuscript related to the difference in maximum and minimum water table depth during this year. It is an indicator of the both the soil water deficit created by the trees and the amount of rainfall which makes its way to the watertable. The modelled annual ET values are presented to indicate the influence of bare soil evaporation and transpiration on the system, they suggest that annual rainfall is balanced out by ET. Revegetation with perennials would likely result in a deficit in soil moisture storage thereby resulting in a deeper water table level.

(3) Topographic influence The use of m BGL for the assessment of the impact of perennial tree belts on the water table enables the reader to have an idea of the ecohydrology of the system independent of topography. Initial assessment of the data indicates that it tends to run parallel to the topography at the site. However due to the relatively low hydraulic conductivity and small topographic differences across the site, it is assumed that lateral through flow is minimal. In fact calibration of models was impossible to achieve with a substantial groundwater input. Therefore, this emphasises the impact of vertical water movement. The same comparison has been done using the data in m AHD, producing a similar response though of a smaller magnitude. This will suggest some variation as a result of the position within the paddock.

(4) Belt width Page 4571, line 23: where a belt width of 38m is mentioned, this will be corrected to 32m.

(5) Irrigation influences It is has been briefly mentioned in the introduction that alley farming in the Australia is rainfall reliant. To clarify the point this will be further stipulated in the methodology section of the manuscript.

We thank you again for your comments and look forward to your response.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 4563, 2009.

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