

Interactive comment on “Influence of feedbacks from simulated crop growth on integrated regional hydrologic simulations under climate scenarios” **by P. E. V. van Walsum**

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A revised version of the manuscript is available at ftp://ftp.wur.nl/simgro/doc/Articles/SIMGRO-WOFOST_20120302.pdf All references to figures or tables are to the new version mentioned above.

Reviewer #3 General remarks We have largely rewritten the paper, and added extra material in the form of two appendices.

Section 1 P10154 L7-17. This section is about the rationale of the paper. The introduction has also been strongly modified.

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Section 2 Models and methods. Going into detail about the hydrologic modelling is not considered functional for the paper. The model coupling with WOFOST has been illustrated with a diagram. The used time steps are mentioned when the processes are discussed. The coupling to WOFOST is on a daily basis, as mentioned on p. 7 line 20 (new text). The interception process is modelled with a time step of 1 hour, as mentioned p. 9, line 6.

P 10155, L 15. There is indeed a standalone version of WOFOST that includes a bucket model for the hydrology, but in this study only the crop simulation part is used.

Section 2.1.1 The whole section has been revised.

Section 2.1.2. Indeed, including Eic in the relative transpiration was a wrong idea. We have corrected this in the text (p. 7, line 23-25, new text) and in the calculations.

Section 2.1.4. The assumed effect of CO₂ is now described on p. 9, line 9 and further. In the references a link is given to followed methodology.

Section 2.2-3.1.1 Adding more detail about the regional hydrologic model will not be instrumental for the goal of the article. Though actually much of the asked information is included in the text. We have included a motivation for using the year 2003 in Section 3.1.

Section 3.2 Indeed, the fact that the hay-cutting option was not used in the static model was indeed not a good modelling approach. Thank you for this remark. We have now used the grass dynamics of the median year in the static model. The dynamics are visible in Fig. 9. The high values of LAI above 9 are possible for grass.

Section 3.3 P 10167, L11-25. The amounts as such are significant, i.e. 10% of the potential transpiration. The model uncertainty will to a large extent affect both simulations in a similar way, thus largely cancelling out.

Section 4.1 We have perhaps been over-defensive on this point. In fact our method to calibrate the Kcb(LAI) relationship is based on the field studies used by Feddes (1987).

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In the discussion section we raise the uncertainty question regarding the temperature dependence of water uptake.

Section 4.2. The discussed study of Wegehenkel has now been dropped, since its description is not clear enough to evaluate it really. And it does not contribute to the discussion of our results. As far as we know, we are the first to make a fair comparison between a 'static' and 'dynamic' version of the same basic model.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 10151, 2011.

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