Interactive comment on "Spatially variable hydrologic impact and biomass production tradeoffs associated with Eucalyptus cultivation for biofuel production in Entre Rios, Argentina" *by* Azad Heidari et al.

Anonymous Referee #2

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This ipaper tackles an important issue of the influence of Eucalyptus trees, and different managements strategies, on the hydrological mass balance and flows of catchments. It is well written and a good description of the model application and evaluation is given. But, the application of Eucalyptus is a challenge in SWAT, as it might be the first implementation (as stated by the authors). This would, in my opinion, need a stronger check on the Eucalyptus growth and water use. SWAT usually struggles with tropical forests (as acknowledged in line 1 of page 10, SWAT simulates dormancy in forests), and would for that reason not be suitable for this study.

Some issues to be considered:

1. How are the seasonal dynamics simulated? What is the influence of the simulation of dormancy on the results? How is the interaction with the roots simulated? SWAT is typically not doing this, except if one would use REVAP parameter to mimic this process, but this is not linked to any vegetation/root parameter. How are the trees reacting to drought? 2. Are the simulation results on yields realistic (cfr line 12 of page 8)? Are the relationships with soil depth and precipitation confirmed with observations? 3. Line 17 days "The parameters controlling LAI were adjusted during the hydrologic calibration to optimize ET simulation" but I don't find any comparison or evaluation for the ET simulations. My suggestion is to provide the Hydrological Mass Balance as a check, ideally also ET is evaluated for Eucalyptus. 4. The CN values became very low, and the recharge_DP parameter is very high, and might lead to unrealistic results in the hydrological mass balances with too high deep losses (which are not going to the outlet). 5. Some details are missing. Which evapotranspiration method was used? Which routing method was used? In summary, the model needs a better check, both in the calibration of the hydrology as on the implementation of Eucalyptus in SWAT. In my opinion, SWAT in general, and the model application for this case study, is not ready to be used for scenarios on Eucapyptus plantations and this might lead to wrong conclusions.

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