SOIL
Discussions

Interactive comment on "Quantification of the impact of hydrology on agricultural production as a result of too dry, too wet or too saline conditions" *by* M. J. D. Hack-ten Broeke et al.

Anonymous Referee #2

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The paper is an innovative and original contribution to spatial crop model application options, in regard to deal with spatial uncertainties finding optimum compromise between model complexity and model input data. The paper describes the combination of SWAP and WOFOST models and based on that the development of an statistical metamodel demonstrated for spatial application under a set of framework conditions (for the Netherlands) including present and future climate conditions with focus on yield effects of drought, salt and oxygen stress in soil. Suggestions for minor improvements: - Crops: Please describe in more detail the composition of the grassland type on which experimental data the calibration was carried out (i.e. which are the dominating plants?). For silage maize provide cultivar details i.e. the temperature sum

requirements. - describe if and how the SWAP-WOFOST considers the direct CO_2 effect on crops; is it considered also in the meta model? Discuss potential impacts on drought stress under the climate scenarios. - Beside drought stress more details should be presented on heat stress effects, i.e. if SWAP-WOFOST considers also direct heat effects (i.e. on fertility for maize or grassland grass types) on the selected crops (i.e. on fertility for maize or grassland grass types). This might be important as drought stress can foster direct heat damages of crops, so heat could be the dominating damaging factor. This aspect could be discussed i.e. how it may change under climate change conditions (in Netherlands) and if the calibration data sets did include such expected more extreme conditions to test the simulated crops response?