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Hydrology and Earth System Sciences Discussions

Interactive comment on "Analysis of soil and vegetation patterns in semi-arid Mediterranean landscapes by way of a conceptual water balance model" *by* I. Portoghese et al.

Anonymous Referee #1

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The authors use a variation of a classical single bucket monthly water balance model (probably first used by Thorntwaite and Mather, 1955) to investigate the water balance of four types of crops frequent in a subhumid-semiarid Mediterranean climate area. In a second part of the paper, the authors claim that the results of the model are in agreement with the distribution of the water holding capacity for three of the crops investigated in the area, providing evidence for the validation of both the model results and the hypothesis that the present vegetation patterns, in such a deeply man-managed landscape, are the result of the adaptation of crops to the natural soil-climate conditions.

In general the paper is verbose, providing more results and discussions than the reasonable for the simple model and data. None of the claimed results is supported by any statistical test. There are many simplifications in the course of the paper: the root depths of crops (e.g. grape plants are known to be able to extend their roots as deep as 30 m), and citrus trees are commonly irrigated in semiarid areas. Common well known agricultural concepts like the crop yield factor (quotient between the relative crop yield and the relative evapotranspiration), which varies between 1.15 for wheat and 0.2 for olives are not taken into account.

Finally, the conclusions are not clearly supported by the results and reasoning, whereas the more relevant are really obvious or unoriginal: on the one hand, it may be assumed that, beyond the subsidies, farmers need to adapt their crops to the capability of their soils and climate (or they irrigate them), and, on the other, there are other published papers that really demonstrate the adequacy of the monthly bucket water balance model.

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