

Interactive comment on “Impact of environmental changes and land-management practices on wheat production in India” by Shilpa Gahlot et al.

Anonymous Referee #1

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Based on a dynamic land model, the authors developed the growth processes for spring wheat using field experiments and studied the effects of different environmental factors and land management practices on the spring wheat production in India. The authors have shown that both the increase in CO₂ concentration, availability of water through irrigation and additional nitrogen fertilizer enhance the annual wheat production, while the elevated temperature reduces total wheat productions. The authors also investigate the impact of the above factors on wheat production at five spring wheat environment (SWE) regions. The paper is written in a very decent way and the results contribute to our understandings of the impact of individual environmental factors on wheat production in India.

I have only some minor points to make. First, in the Results section, you discussed

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changes in the overall wheat production. It might be interesting to also include changes in its components, like gross production and respiration in a table. Second, in section 3.3, you analyzed the wheat productions in five SWE regions and their associations with different environmental factors based on the control simulation results. You can also do a similar calculation as done at the country-scale, by comparing results between the control simulation and four sensitivity simulations (that is, you set a constant value to each environmental factor one at a time). In this way, you can probably see the impact of different factors on wheat production at different regions and quantify their overall contributions to the country-scale changes.

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