

# Author's Responses to Comments from the Topical Editor

Soil-2021-41

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Thank you for the thoughtful comments and suggestions. We have accepted the majority of the recommendations you made. The following is a point-by-point response to all comments. All changes made in this iteration have been tracked in the Microsoft Word document.

Sincerely,

Samuel Araya on behalf of all co-authors.

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## General Comments

I think you responded well to all reviewer comments. I gave the paper another careful perusal and you find the comments in the attached pdf. Please check the units carefully and I propose to use pressure head consistently throughout the paper and avoid the medley of suction, tension, matric potential in kPa or cm, minus or positive. Also give some information about the statistical analyses of the simulation results and how the variability of the hydraulic functions was considered in the simulations.

**We have thoroughly revised the manuscript again to address the issues mentioned. We have now corrected references to soil pressure head to be uniform throughout the manuscript. We have also clarified that the simulation was done for each replicate and results were analyzed on treatment average basis.**

## Point-by-point comments

1. Line 15: check consistency with units used later in the text.

**We have made suction units uniform throughout the manuscript as suggested. In the abstract we prefer it stay as kPa because it is a standard unit of pressure and without explanation present in the body, kPa seems a better choice to us.**

2. Line 19: maybe better: hydraulic states? Hydraulic properties are the retention and conductivity curves?

**We have accepted the recommended change.**

3. Line 20: I could not follow the rationale behind this sentence. What is the difference between water retention and storage? Why does an improvement in storage improves retention? I would rather think it should be opposite: an improvement of retention improves the storage.

**We have clarified the statement by removing the reference to retention and just use storage. We were trying to explain the steady-state retention and the simulated dynamic storage.**

4. Line 134: This seems to be a repetition of the sentence highlighted above.

**We have removed the repeated sentence.**

5. Line 137: Above you write that the project started in 1999? Or should it be: Since 2012, however, the only soil disturbance occurs .... ?

**We have corrected the sentence. For clarity. It now reads: "From 2012 onwards, soil disturbing activity in the NT systems occurs only at times of seeding or transplanting."**

6. Line 143: I know you are living in the Golden State but these are densities of gold. I suppose the units are g kg<sup>-1</sup>?

**We have corrected the units as suggested to realistic carbon numbers.**

7. Line 148: ha<sup>-1</sup>

**Correction accepted.**

8. Lines 170, 182,185: I think it would be better to use pressure heads consistently through the paper. Now you are using tensions, suction, matric potential, heads throughout.

**Throughout the manuscript, we have replaced all pressure measurements to suction in cm.**

9. Line 186: do you mean: recover from turgidity loss? Why should a plant recover from turgidity? When it wilts, it loses turgor.

**We have corrected the statement to read: "limit beyond which plants cannot recover their turgidity."**

10. Line 189: This is rather 'near-field capacity'.

**Comment accepted.**

11. Line 192: Move here.

**We have moved the sentence as suggested.**

12. Line 216: the problem with including this is that the units of h (cm) are not consistent with the units of gamma, rho\_w, and g. I would propose skipping it and write that the factor 1490 is a factor that contains unit conversions, the surface tension of water, the mass density of water and the acceleration due to gravity. The contact angle was assumed to be 0.

**Comment accepted, we have removed the middle equation and variable description.**

13. Line 219: I do not understand why you should have a minus sign here. I think this can be skipped.

**We needed to multiply by -1 as the density function appears inverted because the saturation function is inversely related to pore size.**

14. Lines 220: Was the S(r) function fitted with a spline or the S(ln(r)) function. The latter would be more consistent, I think.

**We have corrected it as suggested.**

15. Line 225 I could not find back whether you did more than one simulation for each treatment using hydraulic properties that were derived from different soil samples. Looking at table B1, I think you must have since you are also doing statistical tests on the simulated water contents and storages. It is important to include the information in the text that you did several simulations for each treatment and to write how the hydraulic functions for each simulation were derived.

**we have added a sentence to explain this information as:** *"We performed a total of 16 independent simulations, one for each treatment plot, using soil hydraulic properties that were derived from the respective treatment soil samples."*

16. Line 231: the gravity term is missing in the equation.

**The effect of gravity is already captured in the pressure head change along the vertical coordinate space. The equation is taken from the HYDRUS-2D manual and represents how flow is simulated.**

17. Line 233: you have used h already for suction.

**We have changed it to capital H to avoid inconsistency with the rest of the manuscript.**

18. Line 374: I suppose you mean section 3.1? "appear"

**We have corrected the number and the typo.**

19. Line 413: This seems very high to me. It suggests that the majority of the rainfall would run off in the plots without CC, which seems quite unexpected. Or is the infiltration capacity increased by a factor 2.8?

**The infiltration time was faster by a factor of 2.8. We have clarified the statement as:** *"an increase by a factor of 2.8 times compared to ..."*

20. Lines 419, 477: 'apparent'. 'dimensional'

**We have corrected the typos.**

21. Line 514: a

**We have corrected the statement as:** *"there were no apparent differences..."*.

22. Line 563: independently. negligible.

**Both typos have been corrected.**

23. Line 594: decrease for which treatment?

**We have corrected the sentence as:** *"Suggested soils under NT-CC practices had less ability to store water."*

24. Line 603: see comment in the abstract.

**We have corrected this statement in the same manner to the correction we made in the abstract.**

25. Line 605: delete "to".

**Comment accepted.**