

## Comment on hess-2022-142

Anonymous Referee #1

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Referee comment on "The natural abundance of stable water isotopes method may overestimate deep-layer soil water use by trees" by Shaofei Wang et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-142-RC1>, 2022

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With great pleasure I read your manuscript, where you investigate the water use strategy of apple trees by different ages. You injected labeled water (D2O) and studied at which depth the trees withdraw their waters. This analysis was carried out for three different growing stages. The paper is very well structured, easy to read, informative figures and in good English language. The applied method is correct and I have no comments about the conclusion. Hence my comments limit mostly to technical issues, except from the following two comments:

- From a scientific point of view your work is really interesting, but the question remains what we can do with this information (social relevance). Furthermore, the study only looks at one growing cycle and ignores that water use strategies change depending on water availability (or climate). In case plants experience dry spells, their roots develop differently in comparison to plant that do not experience dry spells. So there is also a long-term strategy, where plants (sometimes) can adapt to climate change. Could you discuss on this topic?
- Data availability: I don't think the current data-statement is sufficient. Data that is used in publications should preferably be available online and not "upon request". The latter is only possible in exceptional cases. If this is the case, this should be justified.

Technical issues:

- L60: BYF is not explained in the main text (only in the abstract). I think it's good practice to define abbreviations the first time you mention them in the main text.
- L888: unit of annual rainfall in mm/y
- Table1: I would recommend to change the way the units are provided. I would skip the '/' and use brackets.
- L155-and further: all variables/parameters should be in italic.

- L156: "mean annual Pt": this is long-term Pt? If so, provide period. Furthermore unit should be mm/y
- L156-157: but the monthly rainfall can differ a lot (see figure2b). So is 2019 a normal year?
- Fig 2: unit of precipitation is mm/day (LEFT) and mm/month (RIGHT)
- Fig 5: I would rotate this figure 90 degrees, so you can more easily compare the figures with fig 3, 4, and 6
- L212: "with relative higher reliance": I am not fully understand this sentence. Could you explain?