

Review: “Isotopic approaches to quantify root water uptake: a review and comparison of methods” by Rothfuss and Javaux

General comments:

The authors did a great job in editing the manuscript. The structure of the paper is much better now and easier to follow. However, the authors should check the tenses they use and be more concise. After considering my following suggestions, I would consider the manuscript ready for publication.

Specific comments:

p. 1 l. 20ff: This sentence is rather confusing. Consider editing the sentence structure.

p. 2 l. 8: “...hormonal stress signals...”

l. 17ff: “...the root’s ability to extract water...”; “...to fulfill the plant’s water demand...”; “...between soil and roots.”

l. 21: “..., and exudation.”

p. 6 l. 4 ff: add the study by Martín-Gómez (2016) about evaporative enrichment of xylem water in woody stems to this paragraph

l. 15: “...fall on an “evaporative line...”; consider defining “evaporative line”

l. 17: Chose a more descriptive rather than a too general section title here.

p. 7 l. 10: “In a third class (...),...”

l. 14: “...in section 3.2 of this paper.”

l. 18: wording

l. 31: “...in section 4 of this paper.”

l. 32: wording

p. 8 l. 13: “In the example presented in Fig. 2b...”

l. 19: “...when RLD is constant over depth...”

l. 20: “The graphical inference method may not...”

p. 9 l. 2: Two end-member mixing models

l. 23-24: sentence structure: “...or by taking additional errors...and vacuum distillation into account.”

l. 26: “...should have greatest possible isotopic dissimilarities with a low standard error of x.”

p. 10 l. 13: “Figure 3 also illustrates...”

l. 19: between 0.3 and 0.4 meter depths

l. 21: “...in dual isotope space.”

l. 20 ff: Several studies observed differences in terms of uptake depth when considering either the one or the other isotope. This is worth mentioning.

p. 11 l. 4: “...not likely or possibly...”

l.7: "...depends on the value of the contributing increment..."

l. 20: delete "by" ...IsoSource

l. 23: "...and to (ii) provide a

l. 24: "For this study, they used..."

p. 12 l. 22: "The reader is referred to..."; "...to Appendix B2 on how it was implemented for our intercomparison."

p. 13 l. 3: "They"; who is "they"?

l. 4: Why was this plant chosen explicitly?

l. 19: "...were fixed to 10 and 0.25%,..."; also no space character between numbers and %; applies to the whole manuscript

l. 22: "Finally,..."

l. 24: "...methodology, the reader is referred to..."

l. 26: "simulated" -> repetition

l. 27: Couvreur et al. (2012)

p. 14 l. 2-3: "...term of Eq. (1) was proportionally larger (i.e., S_{comp})"; sentence structure

l. 6: "were" instead of " could be"

l. 8: "uppermost" layer (0–0.225m)

l. 21 ff: Wording/punctuation

p. 15 l. 10: "...via the analytical model"

l. 12: punctuation

l. 13: "However,..." ; this applies to the whole manuscript

l. 29: "...should therefore be..."

p. 16 l. 1-2: "...for theoretically improving the different methods outputs..."

l. 3: "However, this was never the case when considering results of..."

l. 3 ff: wording; edit this sentence

l. 8-9: "...with an auger from few centimeters down to meters, ..."

l. 13: You want to increase sampling intervals close to the soil surface: "minimal" is confusing here. Rewrite this and the previous sentence.

l. 17 ff: "...factor, thus, can be sampled multiple times to overcome or characterize..."

l. 22 ff: Confusing sentence structure. Chose a different word for "organ", maybe green plant parts

l. 24-25: What do you mean by "non-conducting" → water-bearing?

p. 17 l. 9: Why do you mention the azeotropic distillation method here? There are multiple other methods available. Which method was commonly used in your reviewed literature?

l. 20: add "in-situ" and "high-frequency"

l. 31: "...is not limited for isotope analysis."

l. 33: spectroscopes

p. 18 l. 1: "greatly sensitive" -> wording

- l. 2: "...which was addressed by Pratt et al. (2016) and Orlowski et al. (2016b)." The study by Pratt et al. (2016) only applies to vapor measurements.
- l. 6-7: "This should be further tested for other..."
- l. 8 ff: Mention the study by Martín-Gómez (2016) here.
- l. 20: deep-rooting
- p. 19 l. 14: "For example, Rothfuss et al. (2012) ran an..."
- l. 17: "...of the transpired water was..."
- l. 19 ff: The authors are using "also" way too often. This applies to the entire manuscript.
- p. 20 l. 6: "...and, thus,..."
- l. 8: "...as they allow for a reduction of..."
- l. 11 ff: The authors should not forget about the time and costs of such experiments.
- p. 21 l. 5: "...is a powerful..."
- l. 9 "In this review₁..."
- l. 10 ff: The authors should include a few sentences about the methodology before they jump into the description of the results.
- l. 14: How was the performance? good/bad/great?; Parnell et al. (2010)
- l. 18: "...call for (i) further developments..."
- l. 19: replace "organs" by another word