We would like to express our sincere gratitude to the reviewer. Your meticulous review and valuable suggestions have played a vital role in enhancing the academic quality of this manuscript. Each of your recommendations has prompted us to re-examine the logic, methodology and presentation of our conclusions, resulting in a more rigorous argument and clearer exposition. Your expert guidance has not only helped to refine this paper but has also prompted us to reflect more deeply on our future research.

1. Throughout the manuscript, superscript and subscript formatting is inconsistent. This is particularly noticeable in isotope notation (e.g., $\delta^{2}H$ (δ2H), $\delta^{18}O$ (δ18O)), where many characters are not properly formatted as superscripts/subscripts (e.g., line 49).

Reply: We would like to express our sincere gratitude to the reviewers for their thorough review and valuable suggestions. We have carefully checked the entire manuscript and made the necessary revisions. Thank you once again for your suggestions.

2. The manuscript contains excessive and incorrect usage of long dashes (—). These often appear in unnecessary or inappropriate positions in scientific writing. Please carefully revise all dash usage (e.g., line 31).

Reply: Thank you for your feedback. These formatting errors significantly affect the readability of the manuscript, and we have now made corrections throughout the revised version.

3. Table 1: Are the four plant species of the same age? Please supplement with crown width data. Currently, the DBH of the four species shows significant variation—does this reflect a distinction between trees and shrubs? Additionally, when is the leaf-fall period for the two deciduous species? During sampling in December and January, were leaves still present on the plants?

Reply: Thank you for your suggestion. We have supplemented the tree age and crown width information. Due to the limitations in rooting depth, shallow-rooted tree species

are unlikely to attain the same diameter at breast height (DBH) as deep-rooted trees. Therefore, in selecting target plants, we prioritized individuals with substantial differences in DBH to better capture the characteristics of water age associated with different rooting depths. Additionally, we have noted that *Ailanthus altissima* and *Juglans regia* have deciduous periods, and this has been addressed in the experimental protocol. Further data will be supplemented once the root system investigation is completed.

Namely: The parameters including diameter at breast height (DBH), tree height, tree age, and crown width are presented in Table 1. The deciduous period for Ailanthus altissima and Juglans regia is from December to April.

Species	Leaf habit	DBH (cm)	Canopy (m^2)	Tree age (years)	Height (m)	Functional
Ailanthus altissima	deciduous	47.8±2.75	50.6–54.2	23±1	11.8±0.8	deep-rooted
Juglans regia	deciduous	25.8±2.95	25–36.3	21±3	6.9±0.8	deep-rooted
Zanthoxylum bungeanum	evergreen	3.8±0.88	7.7–9.4	13±1	2.5±0.5	shallow-rooted
Eriobotrya japonica	evergreen	8.4±0.35	10.2–16.5	15±1	3.4±0.4	shallow-rooted

4. Regarding "2.2.2 Experimental Sample Collection," the collection procedures for different sample types could be further subdivided for clearer readability..

Reply: We are very grateful to the reviewers for raising these points, as they have given us the opportunity to further refine our experimental protocol and provide readers with a clearer description of the sampling procedure.

5. Lines 188–191: The authors only state that no isotopic shift occurs when the extraction volume exceeds 1.5 mL. Is there evidence to support this? If any shift

remains, correction should be applied.

Reply: We are very grateful to the reviewers for their valuable comments. We have carried out the relevant experiments and will include the results in the appendices of the manuscript.

6. Line 302: What does “SD” stand for? It is recommended to define this in the Methods section.

Reply: We are very grateful to the reviewer for raising this important point. We fully agree, and have now included a statement of the relevant representative meanings in the statistical analysis.

Namely: To test the differences in root-zone water replenishment and transpiration water age among plants with different rooting depths and across seasons, a one-way analysis of variance (ANOVA) was used for significance testing. This analysis was performed using IBM SPSS Statistics 26 (IBM Inc., Armonk, NY, USA) at a significance level of $p > 0.05$. In the text, "SD" stands for Standard Deviation, which is used to measure the dispersion of data relative to the mean. All charts and visualizations were generated using Origin 2021 (Origin Software Inc., Fairview, TX, USA).

7. Figure 9 only describes using ERT to invert subsurface water content but does not specify which software was used. Please include this in the Methods section.

Reply: Thank you for your reminder. We have added the relevant content in the methodology section, as detailed in the manuscript "2.5 Selection of ERT Survey Lines".

Namely: To investigate the subsurface moisture distribution in plant root zones, this study employed Electrical Resistivity Tomography (ERT) to conduct two-dimensional profile imaging of typical sample plots. ERT measurements were performed using the ABEM Terrameter LS2 system (ABEM, Sweden), with 32 electrodes deployed along each survey line at an electrode spacing of 1.0 m, achieving an exploration depth of approximately 8 m. The acquired ERT data were processed

using the open-source resistivity inversion software ResIPy, developed by Professor Andrew Binley's team at Lancaster University (Blanchy et al., 2020). ResIPy enables accurate inversion and interpretation of resistivity data, revealing moisture distribution within the rhizosphere zone. In two typical sample plots within the study area, two survey lines were established in each plot, traversing the root zones of deep-rooted tree species (*Ailanthus altissima*, *Juglans regia*, *Koelreuteria paniculata*) and shallow-rooted tree species (*Zanthoxylum bungeanum*, *Eriobotrya japonica*, *Broussonetia papyrifera*), respectively (detailed information on the relevant plants can be found in Table A1). The survey lines were oriented perpendicular to the topographic contours to ensure they traversed the plant root zones and extended to both sides to cover the potential water uptake range.

8. Unify the format for citing figures throughout the manuscript (e.g., line 400 vs. line 406).

Reply: Thank you for bringing this to our attention. We have reviewed the entire text and taken steps to minimise the occurrence of such errors.

9. Some sentences are overly long and could be broken down. For example, “the depth of the roots further determines the seasonal variation of the water replenishment rate (β) in the root zone.” could be revised to “Root depth is a key factor in regulating the seasonal variation of water supply rates within the root zone.”

Reply: We are very grateful for the reviewer comments. We have carefully considered the use of long and complex sentences in the original manuscript and will further refine the language to ensure the manuscript is clear and accessible to readers.