Authors' responses to Editor and Reviewers comments on the manuscript of "Differential response of plant transpiration to uptake of rainwater-recharged soil water for dominant tree species in the semiarid Loess Plateau". Manuscript ID: hess-2021-351.

Dear Editor,

We deeply appreciate you for giving us an opportunity to revise our manuscript. There are two versions of revised manuscripts, the first version is updated manuscript and without track changes (Updated revised version), the second version is highlighted the changes by using the red colored text in the manuscript (track-changes version). Here are the point-to-point responses (responses in upright Roman) to the Editor and Reviewers comments (*original comment in Itali*).

Editor

Thank you for the revised manuscript. The manuscript has significantly improved already. As you can see in the second round of reviews, there are still some revisions proposed by both reviewers. Indeed I think that it is possible with some minor further revisions to address the points raised by the reviewers in this second round. Therefore I have decided to ask you to do a final round of minor revisions responding to the points raised by the reviewers. Subsequently I will do a final review before the manuscript will be published.

Response: Suggestions accepted. Thanks for these suggestions. The further revision has been made according to the suggestions of two **Reviewers.**

In response to **Reviewer 1,** the values of soil bulk density, total porosity, and saturated hydraulic conductivity at 0–200 cm soil depth have been recalculated and added in "2.1 Study site" subsection in "2 Materials and methods" section (Pages 5-6 Lines 134-141). Meanwhile, the Figure 3 has been revised in "3 Results" section (Page 15 Lines 362-367).

In response to **Reviewer 2, firstly,** the variation of net radiation (R_n) and vapor pressure deficit (VPD), and their influence on relative response of normalized sap flow (SF_R) have been added in the revised manuscript (Pages 12-13 Lines 320-321). **Secondly,** the possible anisohydric/isohydric behavior for each species has been added and discussed in the revised manuscript (Pages 20-21 Lines 456-461; Page 23 Lines 512-516). **Thirdly**, the Figure 7 has been revised to clearly exhibit the linear correlation for each species in pure and mixed plantations (Page 19 Lines 416-419).

The detailed and some other revisions can be observed in response to **Comments of Reviewer *1)* and *2)*** as follows.

Furthermore, the language of the revised manuscript has been has been refined by *International Science Editing*.

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David Ashley

INTERNATIONAL SCIENCE EDITING

Reviewer 1

Major Comments:

The revised manuscript answered my questions well. However, I have made additional suggestions below to enhance it.

Response: Suggestions accepted. Thanks for these suggestions. The detailed responses to these two suggestions can be observed in response to *Minor Comments 1)* and *2)* as follows.

Minor Comments:

1) Lines 130-137 The soil bulk density, total porosity, and saturated hydraulic conductivity at 0–200 cm soil depth, rather than 0-50 cm, should be described. Because the similar parameter values were described at 0–200 cm soil depth in Table A1 in Appendix A1.

Response: Recalculated and Revised. In response to this meaningful and detailed suggestion, the soil bulk density, total porosity, and saturated hydraulic conductivity at 0–200 cm soil depth has been recalculated in the revised manuscript. The relative sentence has been rewritten in "2.1 Study site" subsection in "2 Materials and methods" section as follows: "Based on an experiment conducted in July 2018 using the cutting ring (Wu et al., 2016), constant water head (Reynolds et al., 2002), and centrifugation (Qiao et al., 2019) method, the soil bulk density, total porosity, saturated hydraulic conductivity, field capacity, and permanent wilting point at 0–200 cm soil depth were found to be similar in the three plantations. The average soil bulk density was 1.38 ± 0.08, 1.35 ± 0.11, and 1.35 ± 0.09 g cm^{-3} for pure *H. rhamnoides*, pure *P. tomentosa*, and mixed plantations, respectively, and corresponding soil total porosity was 48.2 ± 0.6, 48.1 ± 0.4, and 48.1 ± 0.7%. The average soil saturated hydraulic conductivity was 0.44 ± 0.08, 0.46 ± 0.09, and 0.46 ± 0.08 mm min^{-1} for pure *H. rhamnoides*, pure *P. tomentosa*, and mixed plantations, respectively. The average field capacity was 0.26 ± 0.02, 0.25 ± 0.03, and 0.25 ± 0.02 m^3 m^{-3} for pure *H. rhamnoides*, pure *P. tomentosa*, and mixed plantations, respectively, and corresponding permanent wilting point was 0.06 ± 0.02, 0.06 ± 0.01, and 0.06 ± 0.02 m^3 m^{-3}." (Pages 5-6 Lines 134-144).

To be noticed, the "field capacity" and "permanent wilting point" parameters at 0–200 cm soil depth have also been added in these sentences mentioned above according to the suggestion by **Reviewer *2)***.

2) Lines 351-355 The X-axis of Figure 2 should be same as Figure 1, it should be ranged from DOY 132 to 273 (11 May to 30 September).

Response: Added. The X-axis of Figure 2 has been extended form DOY 132 to 273. The revised Figure 2 can be observed in "3.2 Variations in sap flow" subsection in "3 Results" section as follows:"

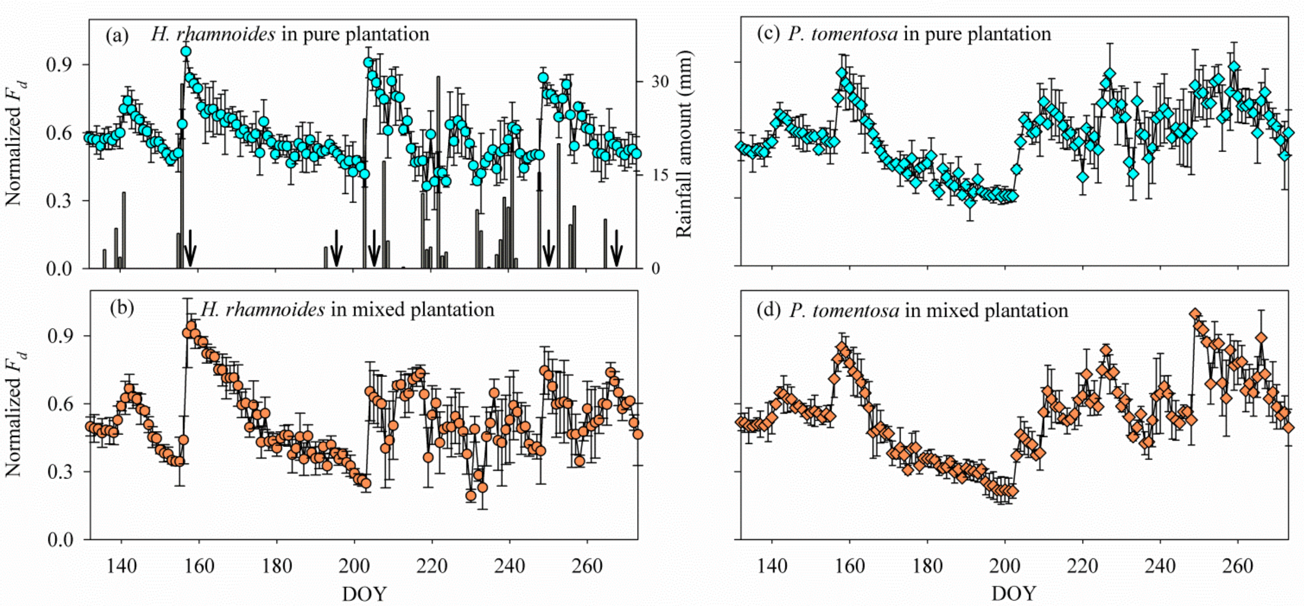


Figure 3. Variation in (a) rainfall amount, and average daily normalized F_d for *H. rhamnoides* in (a) pure and (b) mixed plantations and for *P. tomentosa* in (c) pure and (d) mixed plantations from DOY 132 to 273 (11 May to 30 September) (n = 3). Arrows in (a) indicate dates of sample collection at the first day after rainfall events: DOY 157 (6 June), DOY 194 (12 July), DOY 204 (23 July), DOY 249 (6 September), and DOY 266 (23 September)." (Page 15 Lines 362-367)

Reviewer 2

Major Comments:

The study on which the manuscript is based is well structured, with clear and important objectives and a vast array of methodologies to investigate them and support the results. I think the manuscript benefited in readability and quality from the previous reviews.

1) The first major comment I have to regard the choice to base all the considerations about the behavior of the two tree species on a few days after different rainfall amounts. If this is acceptable in dry periods when minor rainfall events occur after a relatively long period without rain and thus we can consider the trees under water stress conditions, which presupposes that there is an active physiological control on tree transpiration, the same may not be valid in presence of higher water availability. Looking at Fig. 1 it seems that after DOY 200 rainfall events are quite frequent and SWC keeps at relatively high values (at least up to 50 cm depth). This means that in this situation water availability may not be the most influential factor on SF, but a stronger role may be played by the environmental variables (determining the atmospheric demand for water). Although the effect of ETo was discussed with apparently no effect on SF (lines 455-463), I think it would be worth analyzing the SF response to key climatic variables (such as net radiation and VPD) on days with relatively good water availability, to have a clearer picture of the transpiration variability of the two tree species in the pure and mixed plantation.

Response: Suggestions accepted and Added. Thanks for this meaningful and detailed suggestion, the variation of net radiation (R_n) and vapor pressure deficit (VPD), and their influence on relative response of normalized sap flow (SF_R) have been added in the revised manuscript.

Firstly, the variation of R_n and VPD has been added in the "3.1 Variation in environmental parameters and plant fine root vertical distribution" subsection in "**3 Results**" section as follows: "The R_n and VPD also exhibited higher and lower values during the low and high rainfall event periods, respectively (Fig. S4)" (Pages 12-13 Lines 320-321).

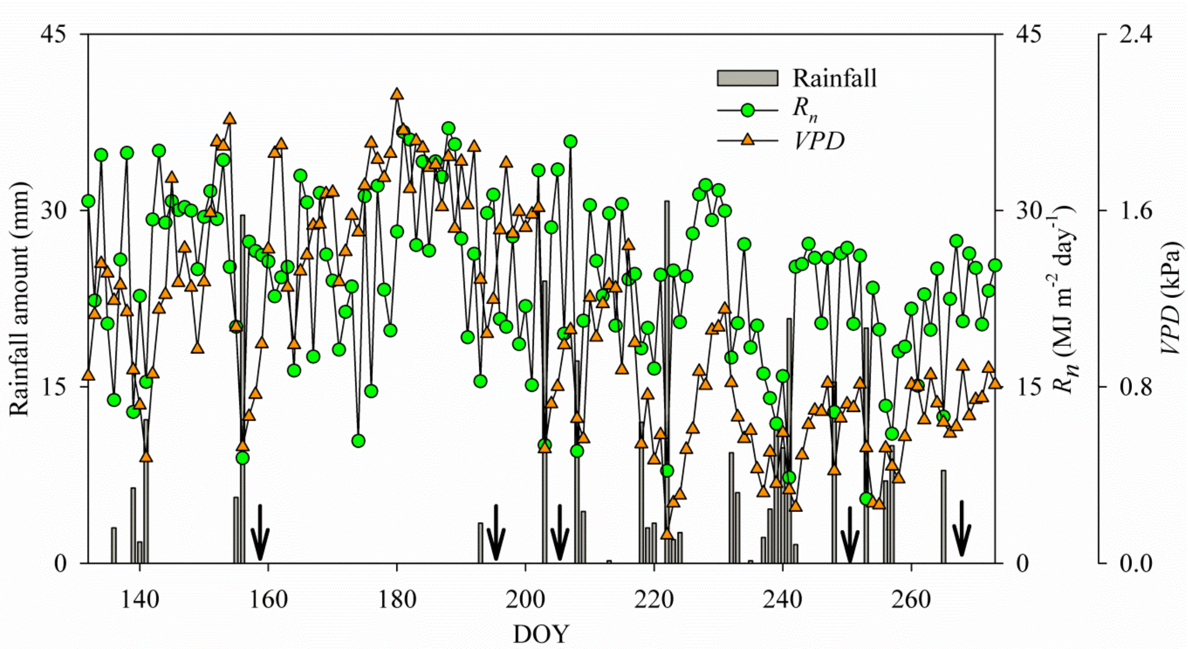


Figure S4. Variation in rainfall amount, net radiation (R_n), and vapor pressure deficit (VPD) from DOY 132 to 273 (11 May to 30 September). Arrows indicate dates of sample collection at the first day after rainfall events: DOY 157 (6 June), DOY 194 (12 July), DOY 204 (23 July), DOY 249 (6 September), and DOY 266 (23 September).

The relative low (DOY 132–202) and high rainfall event (DOY 203–273) period has been mentioned before this sentence in "3.1 Variation in environmental parameters and plant fine root vertical distribution" subsection in "**3 Results**" section as follows: "The ET_0 (554.7 mm) was approximately twice the rainfall amount during the study period, with the higher and lower values during the low (DOY 132–202) and high (DOY 203–273) rainfall event periods, respectively (Fig. 1)." (Page 12 Lines 317-320).

Secondly, the influence of R_n and VPD on SF_R in pure plantation during the observation (DOY 132–273) and relative high rainfall event (DOY 203–273) periods have been added in the revised manuscript in "4.1 RRS uptake enhances plant transpiration for *H. rhamnoides* but not *P. tomentosa* in pure plantations" subsection in "**4 Discussion**" section as follows: "The ET_0 and VPD represent the atmospheric evaporative demand factors and R_n represents the energy factor, and these factors have been observed to influence plant transpiration (Du et al., 2011; Iida et al., 2016; Li et al., 2021).

However, in the present study, none of ET_0, R_n, and VPD after rainfall or relative response of ET_0, R_n, and VPD significantly influenced SF_R for either species in pure plantations (Table S7).” (Page 21 Lines 472-476).

Thirdly, the influence of R_n and VPD on SF_R in mixed plantation has been added in the revised manuscript in “4.2 RRS uptake enhances plant transpiration for coexisting species in mixed plantation” subsection in “**4 Discussion**” section as follows: “Furthermore, no significant relationship of SF_R with ET_0, VPD, and R_n after rainfall and of SF_R with relative response of ET_0, VPD, and R_n was observed for these species in the mixed plantation from DOY 132 to 273 and from DOY 203 to 273 (Table S7).” (Page 24 Lines 521-524)

Table S7. The linear regression relationship between relative response of normalized sap flow (SF_R) and reference evapotranspiration (ET_0), net radiation (R_n), and vapor pressure deficit (VPD) after rainfall, and between SF_R and relative response of ET_0, R_n, and VPD from DOY 132 to 273 and from DOY 203 to 273.

Period	**Independent factors**	***H. rhamnoides* in pure plantation**		***H. rhamnoides* in mixed plantation**		***P. tomentosa* in pure plantation**		***P. tomentosa* in mixed plantation**	
		R^2	p	R^2	p	R^2	p	R^2	p
DOY 132–273	ET_0	0.18	0.47	0.11	0.59	0.44	0.22	0.39	0.26
	VPD	0.09	0.62	0.02	0.83	0.26	0.38	0.22	0.43
	R_n	0.06	0.68	0.04	0.74	0.04	0.75	0.03	0.8
	Relative response of ET_0	0.35	0.32	0.61	0.12	0.12	0.56	0.25	0.4
	Relative response of VPD	0.3	0.34	0.48	0.2	0.06	0.7	0.12	0.57
	Relative response of R_n	0.08	0.74	0.02	0.84	0.1	0.61	0.07	0.66

	ET_0	0.15	0.75	0.25	0.67	0.009	0.98	0.003	0.97
	VPD	0.14	0.76	0.24	0.67	0.008	0.99	0.002	0.97
DOY	R_n	0.31	0.63	0.44	0.54	0.04	0.87	0.06	0.84
203–273	Relative response of ET_0	0.06	0.84	0.01	0.93	0.35	0.59	0.31	0.63
	Relative response of VPD	0.79	0.3	0.67	0.39	0.29	0.64	0.34	0.6
	Relative response of R_n	0.03	0.9	0.09	0.81	0.05	0.86	0.03	0.89

The regression equation is y=ax+b for all equations. Relative responses of R_n, VPD, and ET_0 are respectively calculated as for SF_R in Eq. (4), corresponding to before and the first day after rainfall event parameters for R_n, VPD, and ET_0.

There are three selected rainfall events (7.9, 15.4 and 24 mm) after DOY 203, when the SWC at 0-50 cm become at relatively high values. The non-significant influence of ET_0, R_n, and VPD after rainfall on SF_R, and non-significant influence of relative response of ET_0, R_n, and VPD on SF_R were detected from DOY 132 to 273 and from DOY 203 to 273.

For example, the influence of ET_0 and relative response of ET_0 on SF_R from DOY 203 to 273 can be observed in **Figure explain 1** as follows**.**

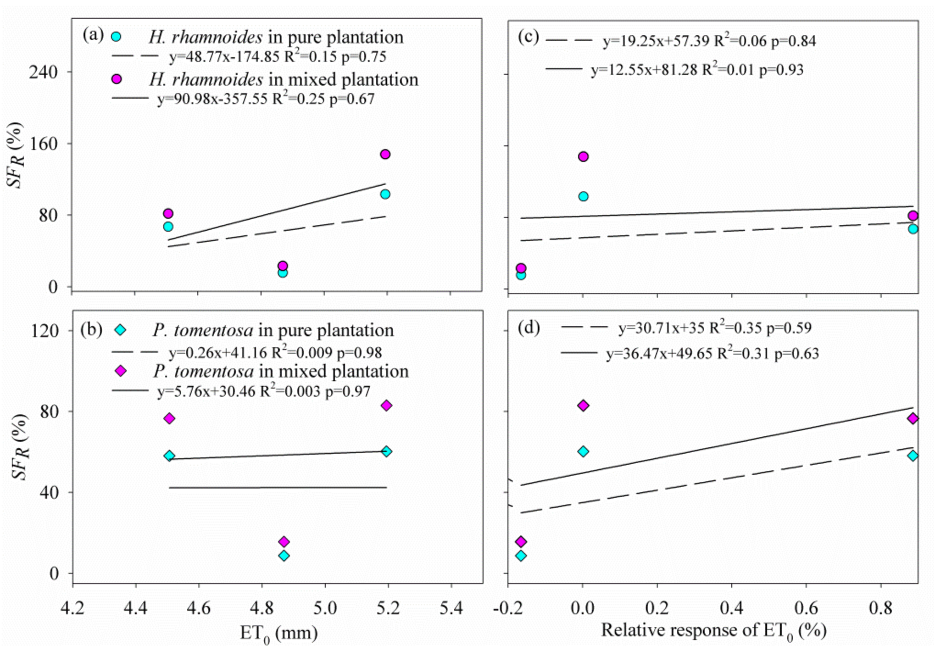


Figure explain 1. Relationship of (a, b) reference evapotranspiration (ET_0) and (c, d) relative response of ET_0 with relative response of normalized F_d (SF_R) for *H. rhamnoides* and *P. tomentosa* in both plantation types.

The influence of VPD and relative response of VPD on SF_R from DOY 203 to 273 can be observed in **Figure explain 2** as follows**.**

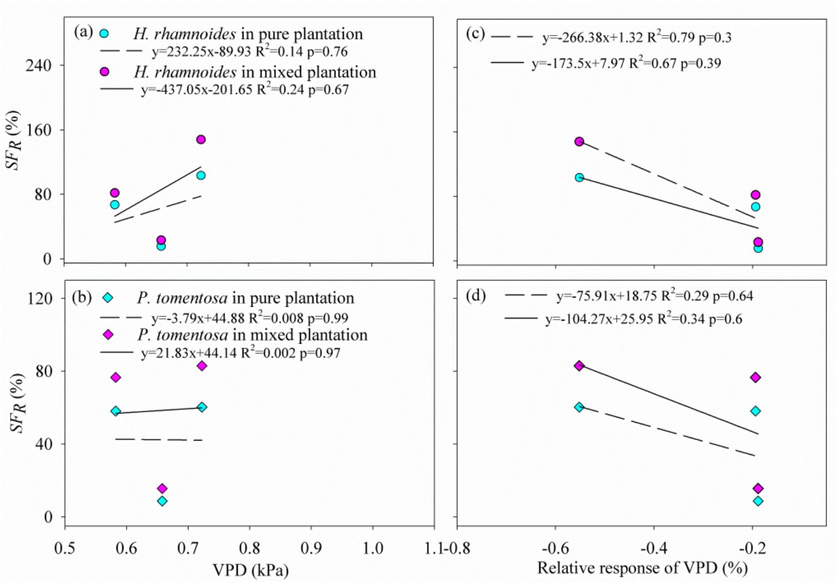


Figure explain 2. Relationship of (a, b) vapor pressure deficit (VPD) and (c, d) relative response of VPD with relative response of normalized F_d (SF_R) for *H. rhamnoides* and *P. tomentosa* in both plantation types.

The influence of R_n and relative response of R_n on SF_R DOY 203 to 273can be observed in **Figure explain 3** as follows**.**

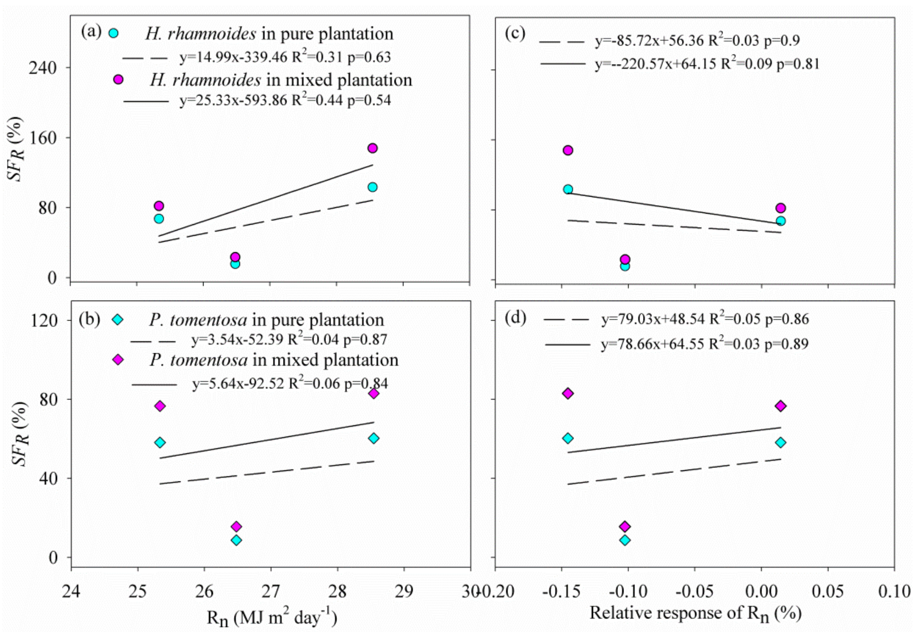


Figure explain 3. Relationship of (a, b) net radiation (R_n) and (c, d) relative response of VPD with relative response of normalized F_d (SF_R) for *H. rhamnoides* and *P. tomentosa* in both plantation types.

References:

Du, S., Wang, Y. L., Kume, T., Zhang, J. G., Otsuki, K., Yamanaka, N., and Liu, G. B.: Sapflow characteristics and climatic responses in three forest species in the semiarid Loess Plateau region of China, Agr Forest Meteorol, 151, 1-10, 2011.

Iida, S., Shimizu, T., Tamai, K., Kabeya, N., Shimizu, A., Ito, E., Ohnuki, Y., Chann, S., and Keth, N.: Interrelationships among dry season leaf fall, leaf flush and transpiration: insights from sap flux measurements in a tropical dry deciduous forest, Ecohydrology, 9, 472-486, 10.1002/eco.1650, 2016.

Li, H. Q., Zhang, F. W., Zhu, J. B., Guo, X. W., Li, Y. K., Lin, L., Zhang, L. M., Yang, Y. S., Li, Y. N., Cao, G. M., Zhou, H. K., and Du, M. Y.: Precipitation rather than evapotranspiration determines the warm-season water supply in an alpine shrub and an alpine meadow, Agr Forest Meteorol, 300, ARTN 108318, 10.1016/j.agrformet.2021.108318, 2021.

2) A second major comment regards the different sensitivity of H. rhamnoides and P. tomentosa with respect to rainfall pulses. Mention a possible anisohydric vs. isohydric behavior of the two species, respectively, I think will help to contextualize these findings with respect to the existing literature.

Response: Suggestions accepted and Added. In response to this meaningful suggestion, the possible anisohydric/isohydric behavior for each species has been added and discussed in "**1 Introduction**", "**4 Discussion**", "**5 Conclusions**", and "**Abstract**" sections in the revised manuscript.

Firstly, the characteristics of anisohydric/isohydric plant behavior related to leaf $\Psi_{pd}-\Psi_m$ and plant transpiration has been added in the "**1 Introduction**" section as follows: "For example, plant species that show isohydric behavior generally maintain relative small $\Psi_{pd} - \Psi_m$ to protect stem hydraulic architecture, which is vulnerable to cavitation and limited plant transpiration under varied soil water conditions (Franks et al., 2007; McDowell et al., 2008). However, plant species that show anisohydric behavior are generally less vulnerable to cavitation and adopt relative large $\Psi_{pd} - \Psi_m$ to allow high plant transpiration after rainfall pulses (West et al., 2007; Klein, 2014; Ding et al., 2021)." (Page 3 Lines 61-66)

Secondly, the definition of anisohydric/isohydric behavior for each species (*H. rhamnoides* and *P.*

tomentosa) in pure plantation has been discussed and added in "4.1 RRS uptake enhances plant transpiration for *H. rhamnoides* but not *P. tomentosa* in pure plantations" subsection in "**4 Discussion**" section as follows: "Meanwhile, the $\Psi_{pd}-\Psi_m$ was significantly higher for *H. rhamnoides* (0.54 ± 0.26 MPa) compared to *P. tomentosa* (0.2 ± 0.06 MPa) (P<0.01), indicated that *H. rhamnoides* and *P. tomentosa* exhibited anisohydric and isohydric behavior, respectively, based on definitions of Franks et al. (2007) and Klein (2014). Previous studies demonstrated that isohydric plants generally exhibit more conservative transpiration than anisohydric plants when contending with varied soil water conditions (West et al., 2007; McDowell et al., 2008; Ding et al., 2021). The significantly higher (P < 0.001) SF_R for *H. rhamnoides* (56.9 ± 43.9 %) than *P. tomentosa* (35.19 ± 26.9 %) indicated that plant transpiration for *H. rhamnoides* was more sensitive to rainfall pulses than *P. tomentosa*." (Pages 20-21 Lines 456-463)

Franks et al. (2007) and Klein (2014) suggested that isohydric behavior species generally exhibited small $\Psi_{pd}-\Psi_m$, meanwhile, anisohydric behavior species generally exhibited large $\Psi_{pd}-\Psi_m$. In the present study, significantly larger $\Psi_{pd}-\Psi_m$ (0.54 ± 0.26 MPa) was observed for *H. rhamnoides* compared to the value (0.2 ± 0.06 MPa) for *P. tomentosa* (P<0.01) (**Table explain 1**). Thus, *H. rhamnoides* and *P. tomentosa* cab be considered anisohydric and isohydric behavior plant species, respectively.

Table explain 1. The average (mean ± SD) and coefficients of variation (CVs, SD/mean) of gradient of leaf water potential ($\Psi_{pd}-\Psi_m$) and normalized sap flow (SF_R) in *H. rhamnoides* pure plantation, *P. tomentosa* pure plantation, and *H. rhamnoides–P. tomentosa* mixed plantation.

	$\Psi_{pd}-\Psi_m$			SF_R	
	Average (MPa)	CV (%)	*p*	Average (%)	*p*
H. rhamnoides in pure plantation	0.54 ± 0.26	48.2	<0.01	56.9 ± 43.9	<0.001
P. tomentosa in pure plantation	0.2 ± 0.06	30		35.1 ± 26.9	

H. rhamnoides in mixed plantation	0.72 ± 0.32	44.4	<0.01	89.2 ± 80.2	<0.001
P. tomentosa in mixed plantation	0.39 ± 0.09	23.6		50.7 ± 38.1	

The *p* value is the significant detect result for these two plantation species in pure and mixed plantations, respectively. These results were contained in Tables S4 and S6 in the manuscript.

In addition, this study mainly focused on the response of plant transpiration to uptake of rainwater-recharged soil water after 5 rainfall events. West et al. (2007) and McDowell et al. (2008) also suggested that isohydric plant generally exhibited more conservative transpiration than anisohydric plant to contend with varied soil water conditions. Meanwhile, the SF_R value for *H. rhamnoides* (anisohydric behavior species) was significantly higher than that for *P. tomentosa* (isohydric behavior species) ($P < 0.001$). Thus, we suggested that the *H. rhamnoides* was more sensitive to rainfall pulses than *P. tomentosa* in pure plantation based on significant higher SF_R value for former compared with latter plant species ($P < 0.001$).

Thirdly, the anisohydric/isohydric behavior for each species in mixed plantation has been discussed and added in "4.2 RRS uptake enhances plant transpiration for coexisting species in mixed plantation" subsection in "**4 Discussion**" section as follows: "Similar to the results in pure plantations, the significant higher $\Psi_{pd}-\Psi_{m}$ (0.72 ± 0.32 MPa) and SF_R (89.2 ± 80.2%) for *H. rhamnoides* compared to *P. tomentosa* (0.39 ± 0.09 MPa and 50.7 ± 38.1%, respectively) in mixed plantation (Figs. 3 and 6), suggested that *H. rhamnoides* and *P. tomentosa* exhibited anisohydric and isohydric behavior in mixed plantation, respectively, and the former plant species was more sensitive to rainfall pulses than *P. tomentosa*." (Page 23 Lines 512-516).

Fourthly, these discussions and results have been added in the "**5 Conclusions**" section as follows: "In pure and mixed plantations, the large $\Psi_{pd}-\Psi_{m}$ was consistent with high SF_R for *H. rhamnoides* suggesting that this species exhibited anisohydric behavior and sensitivity to rainfall pulses. Meanwhile, the small $\Psi_{pd}-\Psi_m$ was consistent with low SF_R for *P. tomentosa* in both plantation types, and indicated that this species exhibited isohydirc behavior and less sensitivity to rainfall pulses." (Page 25 Lines 563-567).

Finally, we summarized these results and discussions, the relative sentences have been added in the "**Abstract**" section as follows: "In pure and mixed plantations, the large $\Psi_{pd} - \Psi_m$ was consistent with high SF_R for *H. rhamnoides*, and the small $\Psi_{pd} - \Psi_m$ was consistent with low SF_R for *P. tomentosa*, in response to rainfall pulses. Therefore, *H. rhamnoides* and *P. tomentosa* exhibited anisohydric and isohydric behavior, respectively, and the former plant species was more sensitive to rainfall pulses than *P. tomentosa*." (Page 1 Lines 23-26).

References:

Ding, Y. L., Nie, Y. P., Chen, H. S., Wang, K. L., and Querejeta, J. I.: Water uptake depth is coordinated with leaf water potential, water-use efficiency and drought vulnerability in karst vegetation, New Phytol, 229, 1339-1353, 2021.

Franks, P. J., Drake, P. L., and Froend, R. H.: Anisohydric but isohydrodynamic: Seasonally constant plant water potential gradient explained by a stomatal control mechanism incorporating variable plant hydraulic conductance, Plant, Cell and Environment, 30, 19–30, 2007.

Klein, T.: The variability of stomatal sensitivity to leaf water potential across tree species indicates a continuum between isohydric and anisohydric behaviours, Funct Ecol, 28, 1313–1320, 2014.

McDowell, N. G., Pockman, W. T., Allen, C. D., Breshears, D. D., Cobb, N., Kolb, T., Plaut, J., Sperry, J., West, A., and Williams, D. G.: Mechanisms of plant survival and mortality during drought: why do some plants survive while others succumb to drought? New Phytol, 178, 719– 739, 10.1111/nph.16971, 2008.

West, A. G., Hultine, K. R., Jackson, T. L., and Ehleringer, J. R.: Differential summer water use by Pinus edulis and Juniperus osteosperma reflects contrasting hydraulic characteristics, Tree Physiol, 27, 1711-1720, 10.1093/treephys/27.12.1711, 2007.

3) Finally, I think that considering the relevance for the conclusion of the job, the figure of root distribution, currently in the supplemental material (S4), should be included in the main body of the *manuscript.*

Response: Added. The Figure S4 in previous manuscript has been added as ***Figure 2*** in the revised manuscript in "3.1 Variation in environmental parameters and plant fine root vertical distribution" subsection in "**3 Results**" section as follows: "The *H. rhamnoides* and *P. tomentosa* in pure plantations exhibited different fine root vertical distributions, with more than 40% of fine roots observed in shallow and deep soil layers, respectively (Fig. 2)." (Page 13 Lines 330-332; Page 14 Lines 343-345)

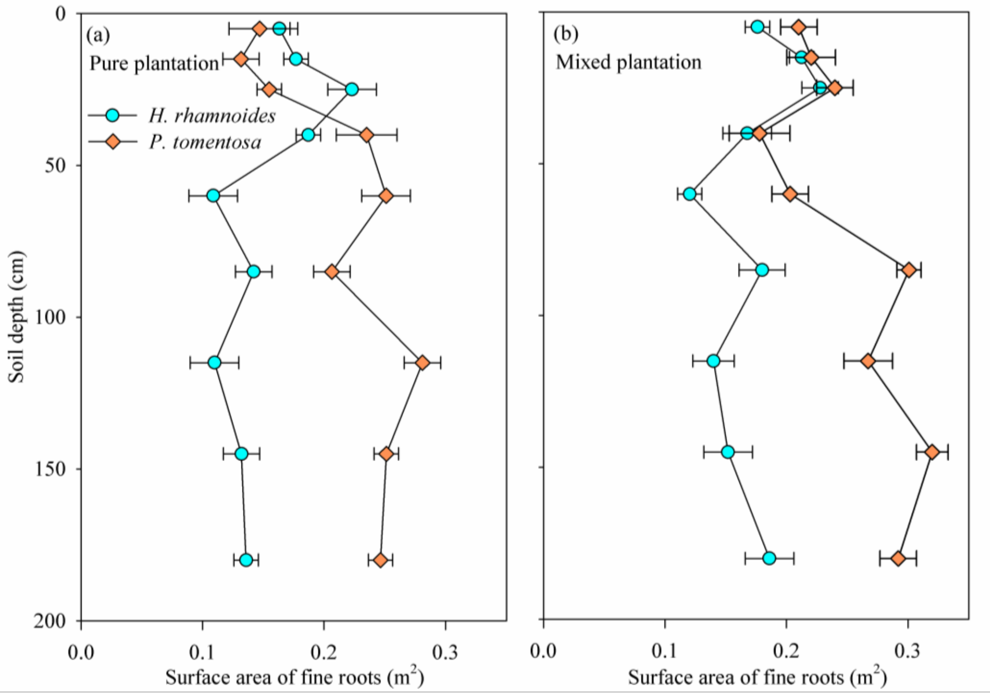


Figure 2. Variation in average surface area of fine root at different soil depths for *H. rhamnoides* and *P. tomentosa* in (a) pure and (b) mixed plantations. Error bars indicate the standard deviation (n = 3).

Minor Comments:

1) L137-141: Please add indications of the value of Soil water content at Field capacity and at the permanent wilting point. This would help the interpretation of Figure 1.

Response: Suggestions accepted. The soil water content at field capacity and permanent wilting point have been added in the revised manuscript.

Firstly, the method detect field capacity and permanent wilting point has been added in the "2.1 Study site" subsection in "**2 Materials and methods**" section as follows: "Based on an experiment conducted in July 2018 using the cutting ring (Wu et al., 2016), constant water head (Reynolds et al., 2002), and centrifugation (Qiao et al., 2019) method, the soil bulk density, total porosity, saturated hydraulic conductivity, field capacity, and permanent wilting point at 0–200 cm soil depth were found to be similar in the three plantations.” (Pages 5-6 Lines 134-137)

Secondly, the value of field capacity and permanent wilting point has been added in the “2.1 Study site” subsection in “2 Materials and methods” section as follows: “The average field capacity was 0.26 ± 0.02, 0.25 ± 0.03, and 0.25 ± 0.02 m^3 m^{-3} for pure *H. rhamnoides*, pure *P. tomentosa*, and mixed plantations, respectively, and corresponding permanent wilting point was 0.06 ± 0.02, 0.06 ± 0.01, and 0.06 ± 0.02 m^3 m^{-3}.” (Page 6 Lines 142-144)

References:

Wu, G. L., Yang, Z., Cui, Z., Liu, Y., Fang, N. F., and Shi, Z. H.: Mixed artificial grasslands with more roots improved mine soil infiltration capacity, J Hydrol, 535, 54-60, 2016.

Qiao, J. B., Zhu, Y. J., Jia, X. X., Huang, L. M., and Shao, M. A.: Pedotransfer functions for estimating the field capacity and permanent wilting point in the critical zone of the Loess Plateau, China, Journal of Soils and Sediments, 19, 140–147, 10.1007/s11368-018-2036-x, 2019.

Reynolds, W.D., Elrick, D.E., Youngs, E.G., Booltink, H.W.G., and Bouma, J.: Saturated and field-saturated water flow parameters, in: Methods of soil analysis, edited by: Dane, J.H., Topp, G.C., Soil Science Society of America, Madison, Wisconsin, USA, 797-878, 2002.

2) L323: you could simplify the phrase stating: …” in the shallow soil layer, with no significant changes in mixed plantations for H. rhamnoides…”

Response: Suggestions accepted. This sentence has been rewritten in “3.1 Variation in environmental parameters and plant fine root vertical distribution” subsection in “3 Results” section as follows: “In the shallow soil layer, no significant changes in fine root proportion were observed for *H. rhamnoides* in pure and mixed plantations ($P > 0.05$).” (Page 13 Lines 332-333)

3) L327: I suggest using only 1 decimal when expressing the percentage: 21.94% 21.9% and so on in the rest of the manuscript (also for CV)

Response: Suggestions accepted and Revised. In response to meaningful suggestion, one decimal was used when expressing the percentage (for example, Page 6 Line 140; Page 6 Lines 146; Page 13 Lines 324; Page 13 Lines 334;) and CV (for example, Page 13 Line 324; Page 17 Lines 400-401) throughout the revised manuscript.

For example, the corrected for percentage expressing in "3.1 Variation in environmental parameters and plant fine root vertical distribution" subsection in "3 **Results**" section can be observed as follows: "However, the fine root proportion of *P. tomentosa* in the shallow soil layer was significantly increased from 21.9% in pure plantation to 31.3% in the mixed plantation ($P < 0.05$)." (Page 13 Lines 333-335)

For example, the corrected for CV expressing in "3.1 Variation in environmental parameters and plant fine root vertical distribution" subsection in "**3 Results**" section can be observed as follows: "The coefficients of variation (CVs, SD/mean) for SW in the shallow soil layer were 18.2%, 16.7%, and 17.3% in *H. rhamnoides* and *P. tomentosa* pure plantations and the mixed plantation, respectively." (Page 13 Lines 323-325)

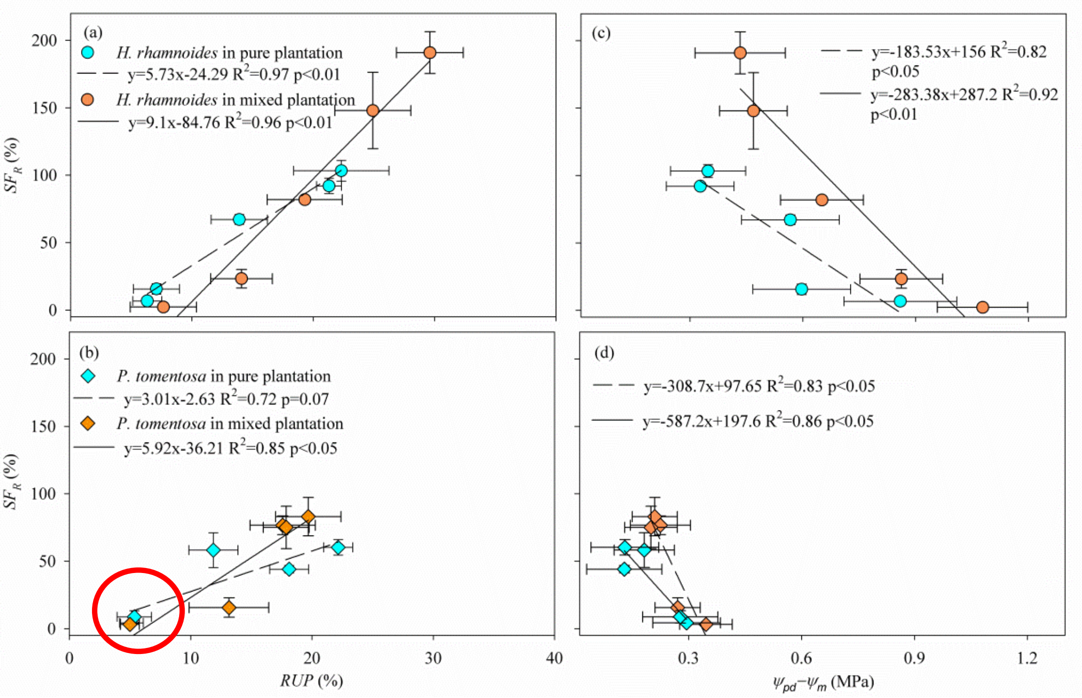
4) L389: what does it mean "positive ψpd"? Not clear

Response: Revised. The "positive ψ_{pd}" has been revised to "higher Ψ_{pd}" in the revised manuscript in "3.4 Variations in plant leaf water potential" subsection in "3 Results" section as follows: "Compared with *P. tomentosa*, *H. rhamnoides* exhibited significantly higher Ψ_{pd} in the pure plantation, lower Ψ_m in the mixed plantation, and larger $\Psi_{pd}-\Psi_m$ in both plantation types ($P < 0.05$) (Table S6)." (Page 17 Lines 401-403)

5) L403: the linear correlation for P. tomentosa in pure plantation is assessed on 4 points only (instead of 5) and the p-value is not far from 0.05... I would avoid such a conclusion of the paragraph.

Response: Clarified and Revised the Figure and relative sentence. Thanks for this detailed and meaningful suggestion. The Figure 7 has been revised to clearly exhibit the linear correlation for each species in pure and mixed plantations, and the relative sentence has also been revised in the revised manuscript.

Firstly, the linear correlation for *P. tomentosa* in pure plantation is assessed based on 5 rather than 4 points. In original Figure 7(b) (**the blue colour point in the red cycle in Original Figure. 7b as follows**), one point for *P. tomentosa* in pure plantation was covered by the point for *P. tomentosa* in mixed plantation.



Original Figure 7. Relationship between average relative response of normalized F_d (SF_R) and (a, b) rainwater-recharged soil water uptake proportion (RUP), and (c, d) leaf water potential gradient (Ψ_{pd}–Ψ_m) for *H. rhamnoides* and *P. tomentosa* in both plantation types (n = 3)."

In the revised **Figure 7**, we changed the symbol type and rearranged the sequential of the symbol to clearly exhibit the linear correlation for each species in pure and mixed plantations. The revised **Figure 7** can be observed in "3.5 Influence of water sources and Ψ_{pd}–Ψ_m on plant transpiration" subsection in "**3 Results**" section as follows: "

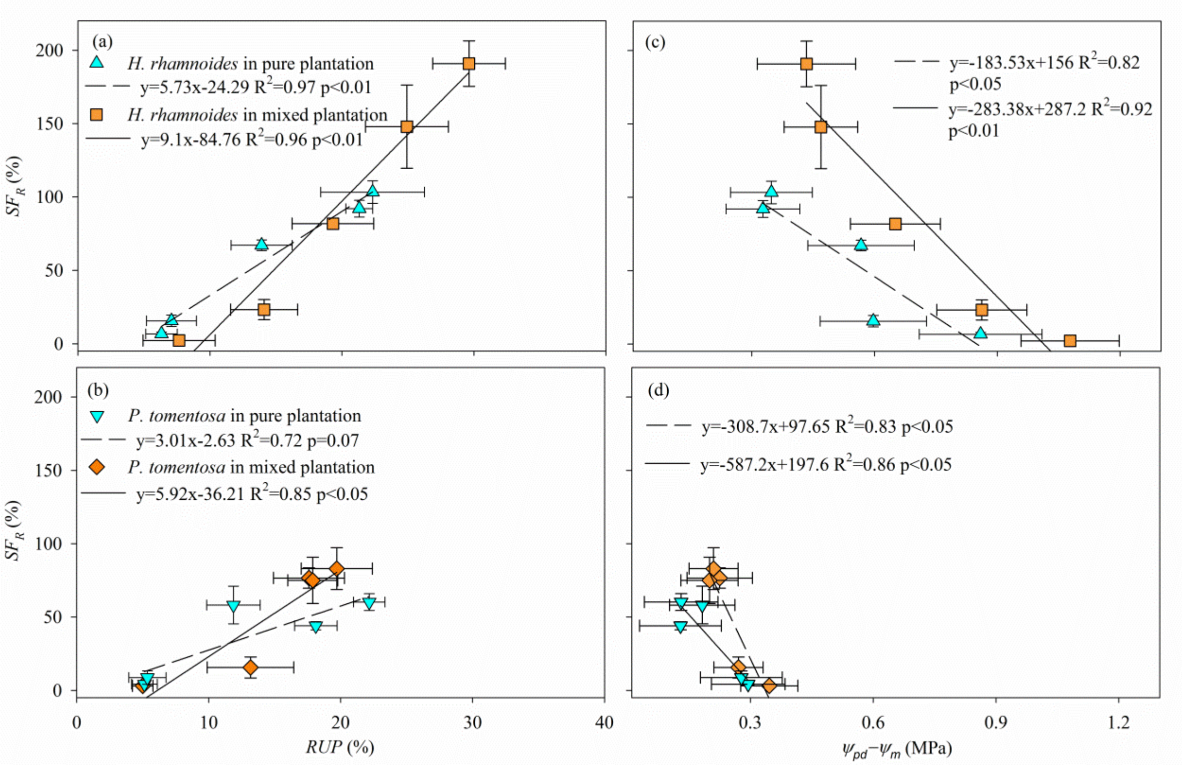


Figure 7. Relationship between average relative response of normalized F_d (SF_R) and (a, b) rainwater-recharged soil water uptake proportion (RUP), and between SF_R and (c, d) leaf water potential gradient (Ψ_{pd}–Ψ_m) for *H. rhamnoides* and *P. tomentosa* in both plantation types (n = 3)." (Page 19 Lines 416-419)

Secondly, because the *p*-value (p=0.07) was close to 0.05 for the linear correlation for *P. tomentosa* in pure plantation, the relative sentence has also been rewritten in "3.5 Influence of water sources and Ψ_{pd}–Ψ_m on plant transpiration" subsection in "**3 Results**" section as follows: "However, a significant relationship between SF_R and RUP was observed for *P. tomentosa* in the mixed plantation ($P < 0.05$) (Fig. 7)." (Page 18 Lines 414-415)

6) L422-423: "exhibiting plasticity in water sources" is not clear. Try to reformulate it in a clearer way (i.e. plant water sources in relation to soil depth"). Plasticity is a rather qualitative description

Response: Rewritten. In the revised sentence, we directly described that these plants uptake water from different soil layers after different rainfall pulses. The revised sentence can be observed in "4.1 RRS uptake enhances plant transpiration for *H. rhamnoides* but not *P. tomentosa* in pure plantations" subsection in "**4 Discussion**" section as follows: "Similar to *Salix psammophila* and *Caragana korshinskii* in the studied region (Zhao et al., 2021), both *H. rhamnoides* and *P. tomentosa* take up water from different soil layers under varied soil water conditions following rainfall pulses in pure plantations (Fig. 5)." (Page 20 Lines 433-435)

7) L424: Why is it so obvious? This paragraph (starting from "in pure…" and ending with "… of no rainfall" need to be reformulated

Response: Rewritten. In response to this meaningful suggestion, this sentence has been rewritten in "4.1 RRS uptake enhances plant transpiration for *H. rhamnoides* but not *P. tomentosa* in pure plantations" subsection in "**4 Discussion**" section as follows: "In pure plantations, large water uptake proportion from the deep soil layer after 3.4 mm of rainfall for *H. rhamnoides* (52.5 ± 8.7%) and *P. tomentosa* (64.1 ± 5.1%) (Fig. 5), suggested that this rainfall amount did not relieve the drought caused by 36 days (DOY 157–192) of no rainfall." (Page 20 Lines 435-438)

In the revised manuscript, the "obviously lower SWC at all soil depths (Fig. 1)" has been deleted to correctly express the result, according to this meaningful suggestion.

8) L489: Again positive ψpd , please check this sentence

Response: Revised. The "positive ψ_{pd}" has been revised to "higher Ψ_{pd}" in the revised manuscript in "4.2 RRS uptake enhances plant transpiration for coexisting species in mixed plantation" subsection in "4 Discussion" section as follows: "Although mixed afforestation did not significantly alter the Ψ_{pd} and Ψ_m for *H. rhamnoides* and *P. tomentosa*, respectively, significantly lower Ψ_m and higher Ψ_{pd} were observed for corresponding species ($P < 0.01$) (Table S6)." (Page 23 Lines 505-507).

In addition, the expression of "positive ψ_{pd}" has been corrected to "higher Ψ_{pd}" throughout the revised manuscript (such as in Page 17 Line 402).