Authors' responses to Reviewer 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 Reviewer,

We deeply appreciate you for giving us an opportunity to revise our manuscript. The point-to-point responses (responses in upright Roman) to the Reviewer comments (*original comment and query in Itali*) can be observed in file named "**Response to Reviewer 1**".

Reviewer 1

Major Comments:

1) Do you have any information about runoff generation of the studied plantation sites? Any runoff after rainfall pulse may influence the result of your manuscript since the contribution of precipitation to plant water uptake is central to your study, although precipitation amount was not the direct independent factor used during the data analysis. So, considered the potential runoff may strengthen and validity your result.

Response: Added and Clarified. Thanks for this meaningful suggestion, the soil bulk densities, soil filtration properties, soil total porosity, and soil capillary porosity have been added in "2.1 Study site" subsection in "**2 Materials and methods**" section as follows: "Based on an experiment conducted in July 2017 through cutting ring method, the soil bulk density, filtration property, total porosity, and capillary porosity at 0–50 cm soil depth were similar in three plantations. The average soil bulk density was 1.34 ±0.04, 1.31 ±0.05, and 1.31 ±0.05 g cm^{-3} for pure *H. rhamnoides*, pure *P. tomentosa*, and mixed plantations, respectively, and corresponding soil saturated hydraulic conductivity was 0.97 ±0.15, 0.96 ±0.13, and 0.99 ±0.11 mm min^{-1}. The average soil total porosity was 48.25 ±0.52, 48.17 ±0.48, and 48.03 ±0.63% for pure *H. rhamnoides*, pure *P. tomentosa*, and mixed plantations, respectively, and corresponding soil capillary porosity was 38.89 ±1.57, 39.02 ±1.26, and 38.95 ±1.87%."

In addition, the relative sentences have also been added in “4.3 Implications for plantation species and type selection based on RRS uptake and plant transpiration” subsection in “**4 Discussion**” section as follows: “In addition, no runoff was generated under 0.74 mm min^{-1} rainfall intensity in silt loam soil in the Loess Plateau (Huang et al., 2014), which had no vegetation cover and similar soil saturated hydraulic conductivity (0.99 ± 0.15 g cm^{-3}) to that in the present study. Pan and Shuangguan (2005) also observed no runoff generation under 1.5 mm min^{-1} rainfall intensity for vegetation covered plots with 15 ° slope in the Loess Plateau. Direct observation for possible runoff after large rainfall events in further studies would be helpful for evaluating plantation species adaptability in the studied region, although Zhao et al. (2013) showed that the vegetation cover can enhance soil permeability and reduce water loss in the Loess Plateau. Furthermore, water conservation measures, such as water-fertilizer pits (60 × 60 × 40 cm) (Wang et al., 2020), that can intercept any possible runoff after large rainfall events and deliver it to deep soil layers may be appropriate for the studied region.” (Page 23 Lines 526-536).

In the present study, we did no directly measure the runoff during the experiment period. The studied area is typical loess region with similar or smaller slopes compared with mentioned above studies, such as Pan and Shuangguan (2005) and Zhao et al. (2013). The soil bulk density and saturated hydraulic conductivity (0-50cm) was ranged from1.31 to 1.34 g cm^{-3} and from 0.96 to 0.99 mm min^{-1}, respectively, in the present study, which is similar with the soil bulk density (1.35 g cm^{-3}) and saturated hydraulic conductivity value (0.99±0.15 g cm^{-3}) as the direct runoff experiment in Huang et al. (2014). Huang et al. (2014) suggested that no runoff was generated under 0.7 mm min^{-1} rainfall intensity in silt loam soil in Loess Plateau, with simulated rainfall amount ranged from 53.1 to 77.1 mm.

Furthermore, Pan and Shuangguan (2005) also approved that no runoff generation under 1.5 mm min^{-1} rainfall intensity at vegetation covered plot with 15 ° slope in Loess Plateau. The largest rainfall amount we selected in our study is 35.2mm, which equals to approximately 0.05 mm min^{-1} rainfall intensity and can be observed in **Figure explain 1** as follows, and the slops of our selected plots were approximately 5 °. Thus, we predicted that no runoff is generated during the time of our selected 5 rainfall events. We also suggested the possibility runoff after large rainfall events should be direct observation and would helpful for plantation species adaptability evaluation in the studied region.

According to plantation species and type selection, we also suggested that "Furthermore, water conservation measures, such as water-fertilizer pits (60 × 60 × 40 cm) (Wang et al., 2020), that can intercept any possible runoff after large rainfall events and deliver it to deep soil layers may be appropriate for the studied region." in "4.3 Implications for plantation species and type selection based on RRS uptake and plant transpiration" subsection in "**4 Discussion**" section (Page 23 Lines 534-536).

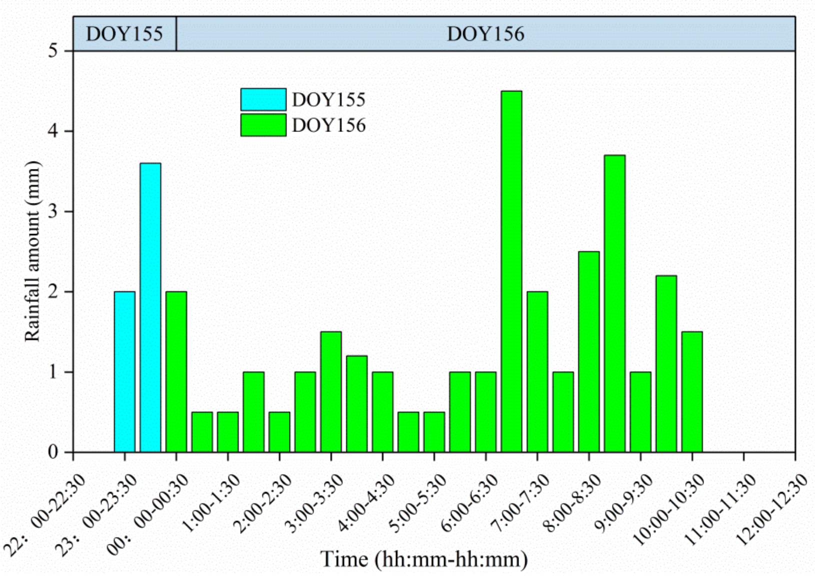

Figure explain 1 The half-hour rainfall amount during DOY155-156. The rainfall during DOY 155-156 was considered as one rainfall event in the present study.

References:

Pan, C. Z., and Shangguan, Z. P.. Influence of forage grass on hydrodynamic characteristics of slope erosion. Journal of Hydraulic Engineering, 3, 371–377. https://doi.org/10.13243/j.cnki.slxb.2005.03.020 (In Chinese with English Abstract), 2005.

Huang, J., Wang, J., Zhao, X. N., Wu, P. T., Qi, Z. M., and Li, H. B.: Effects of permanent ground cover on soil moisture in jujube orchards under sloping ground: A simulation study, Agr Water Manage, 138, 68-77, 2014.

Zhao, X. I., Wu, P., Chen, X. L., Helmers, M. J., and Zhou, X. B.: Runoff and sediment yield under simulated rainfall on hillslopes in the Loess Plateau of China, Soil Res, 51, 50-58, 2013.

Wang, J., Fu, B. J., Wang, L. X., Lu, N., and Li, J. Y.: Water use characteristics of the common tree species in different plantation types in the Loess Plateau of China, Agr Forest Meteorol, 288, ARTN 108020, 10.1016/j.agrformet.2020.108020, 2020.

2) Throughout the manuscript, there are also some instances where the term seems inappropriately use (e.g. only). I would suggest going through the entire paper and refining the language to more accurately reflect the result.

Response: Rewritten and clarified. Thanks for your suggestion, the entire manuscript has been reviewed and the relative terms have been rewritten in the revised version.

For example, based on the suggestion by the other reviewer, the term "plant water consumption" and "rainwater uptake" has been revised to "plant transpiration" and "rainwater-recharged soil water", respectively, in the revised manuscript. The RRS was used as the abbreviation for "rainwater-recharged soil water" in the revised manuscript. And the **Title** of the revised manuscript has also been rewritten as "Differential response of plant transpiration to uptake of rainwater-recharged soil water for dominant tree species in the semiarid Loess Plateau"

For example, the "only" has also been deleted in the revised manuscript in "**Abstract**" section as follows: "In pure plantations, the relative response of daily normalized sap flow (SF_R) was significantly affected by RRS uptake proportion (RUP) and $\Psi_{pd}-\Psi_m$ for *H. rhamnoides*, and was significantly influenced by $\Psi_{pd}-\Psi_m$ for *P. tomentosa* ($P < 0.05$)."

3) Potential/Reference Evapotranspiration is a key parameter indicator that reflect atmospheric evaporative demand, and also support some part of you conclusion. However, why the Reference evapotranspiration (ET0) was used in the study, because there are some other indicator also reflect the evaporative demand.

Response: Clarified and rewritten. In response to this meaningful suggestion, the advantage of Reference evapotranspiration (ET_0) has been added in "2.2 Environmental parameter measurements and ET_0 calculation" subsection in "**2 Materials and methods**" section as follows: "ET_0, considering both aerodynamic characteristics and energy balance, was used to indicate atmospheric evaporative demand (Allen et al., 1998):"

Indeed, there are several Equations that calculated the potential or reference evapotranspiration. The ET_0 equation in the present study is used as the standard method by the FAO (Food and Agriculture Organization of the United Nations), and has been widely used for evaluate other ET_0 equations (Xiang et al., 2020). The advantage of the Equation that we used considered both aerodynamic aspects and energy balance, because evapotranspiration is a process that liquid water is converted vapor phase and then the vapor moves. The detailed information can be observed in a review of difference of reference crop evapotranspiration in Xiang et al. (2020).

References:

Allen, R.G., Periera, L.S., Raes, D., and Smith, M.: Crop evapotranspiration: Guidelines for Computing Crop Requirements, Irrigation and Drainage paper NO.56, FAO, Rome, Italy, 300, 1998.

Xiang, K. Y., Li, Y., Horton, R., and Feng, H.: Similarity and difference of potential evapotranspiration and reference crop evapotranspiration - a review, Agr Water Manage, 232, 10.1016/J.Agwat.2020.106043, 2020.

4) This manuscript should be looked over by a language editing service and/or a native English speaker - there are some grammatically incorrect and/or awkward phrasings.

Response: Rewritten. Thanks for your suggestion; the entire revised manuscript has been reviewed and the language has been refined by *International Science Editing*.

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To whom it may concern,

The paper "Differential response of plant transpiration to uptake of rainwater-recharged soil water for dominant tree species in the semiarid Loess Plateau" by Yakun Tang was edited by International Science Editing. We were asked not to edit the references. Please contact us if you would like to view the edited paper.

Kindest regards,

David Cushley.

If the English is still not meet the standard, please give me another chance, I will revised the language by using another scientific editing service company again.

Minor Comments:

1) Lines 22 "only" is too arbitrary

Response: Deleted. This sentence has been rewritten in "**Abstract**" section as follows: "In pure plantations, the relative response of daily normalized sap flow (SF_R) was significantly affected by RRS uptake proportion (RUP) and Ψ_{pd}–Ψ_m for *H. rhamnoides*, and was significantly influenced by Ψ_{pd}–Ψ_m for *P. tomentosa* ($P < 0.05$)."

2) Lines 30-32 "Regardless of sensitivity to rainfall pulses" ? this short sentence should be rewritten.

Response: Rewritten. Thanks for this meaningful suggestion**,** this sentence has been rewritten in "**Abstract**" section as follows: "These results indicate that mixed afforestation enhanced the influence of RRS uptake to plant transpiration for these different rainfall pulse sensitive plants."

3) Lines 54-57 The "water uptake" should also be clearly described.

Response: Rewritten. In response to this meaningful suggestion, the sentence has been rewritten in "**1 Introduction**"as follows: "The controversial rainfall pulse response between RRS uptake and plant transpiration may be mainly attributed to an inconsistent influence of plant leaf physiological characteristics (West et al., 2007), root morphology adjustment (Wang et al., 2020), or environmental conditions (Tfwala et al., 2019) on these two water processes."

4) Lines 69-71 the author should be clarified this sentence for pure or coexisting species? Because the similar meaning and sentence can be observed at Lines 57-60.

Response: Revised. Thanks for this meaningful suggestion, this sentence has been revised in "**1 Introduction**" section as follows: "Rainfall pulses have been observed to relieve or eliminate water competition among coexisting species and thus maintain or increase plant transpiration in some water limited regions (Wang et al., 2020; Tfwala et al., 2019)."

Indeed, this sentence should be clarified the influence of rainfall pulses on water competition among coexisting species.

5) Lines 131-132 Please clarify why the Reference evapotranspiration (ET0) was used in the study, as a large number of indicators can reflect atmospheric evaporative demand.

Response: Clarified and rewritten. In response to this meaningful suggestion, the advantage of Reference evapotranspiration (ET_0) has been added in "2.2 Environmental parameter measurements and ET_0 calculation" subsection in "**2 Materials and methods**" section as follows: "ET_0, considering both aerodynamic characteristics and energy balance, was used to indicate atmospheric evaporative demand (Allen et al., 1998):". The detailed explanation can be observed the **Tables and captions** at the end of this file.

6) Lines 213-214 This sentence is nonsense and should be deleted.

Response: Deleted and Rewritten. Thanks for this meaningful suggestion, this sentence has been deleted and rewritten in "2.6.2 Calculation of RRS uptake proportion and water sources from different soil layers" subsection in "**2 Materials and methods**" section as follows: "In addition to RUP, the water uptake proportions from different soil layers were calculated on the first day after a rainfall event using the MixSIR program, to complement the analysis of plant water source variations in response to rainfall pulses. The RUP method only calculated the proportion of recent rainwater in the plant stem and did not include soil water before the recent rainfall event (Gebauer and Ehleringer, 2000; Cheng et al., 2006). The water taken up from different soil layers by the plant is a mixture of soil water before the recent rainfall event and the recent rainwater."

References:

Cheng, X. L., An, S. Q., Li, B., Chen, J. Q., Lin, G. H., Liu, Y. H., Luo, Y. Q., and Liu, S. R.: Summer rain pulse size and rainwater uptake by three dominant desert plants in a desertified grassland ecosystem in northwestern China, Plant Ecol, 184, 1-12, 2006.

Gebauer, R. L. E., and Ehleringer, J. R.: Water and nitrogen uptake patterns following moisture pulses in a cold desert community, Ecology, 81, 1415-1424, 2000.

7) Line 306 There are 7 Figures in the paper and the Tables 1-4 are the statistical analysis. These Tables are unnecessary list in the paper and its better remove to Supplementary file.

Response: Rewritten. Thanks for this suggestion, all the Tables have been removed to Supplementary file. The Tables 1-4 have been renamed to Tables S 4-6, respectively, because the origin Tables 1-2 has been combined into Table S4. The detailed Table S can be observed in the revised *Supplementary file*.

8) Line 415 Is synchronization correct in this sentence ? It's not correct, you should check it.

Response: Rewritten. Indeed, the word "synchronization" is not correct in this sentence. The 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: "The asynchronization between RRS uptake and plant transpiration for *J. osteosperma* was mainly attributed to the uptake of RRS by plants being unable to reverse the cavitation in its roots and stems (Grossiord et al., 2017; West et al., 2007)."

9) Lines 478-480 Table S3 does not indicated the relationship between rainfall amount and water source proportion from deep soil layer.

Response: Deleted and rewritten. Thanks for this meaningful suggestion, this sentence has been deleted and rewritten in "4.2 RRS uptake enhances plant transpiration for coexisting species in mixed plantation" subsection in "**4 Discussion**" section as follows: "Similar to other studies in the Loess Plateau (Wang et al., 2020; Wu et al., 2021), the deep soil layer exhibited lower SW than other soil layers in all plantation types in the present study (Fig. 1, Table S3). Jia et al. (2017) and Wang et al. (2020) attributed the lower SW in deep soil layers to the imbalance between rainwater replenishment and plant uptake of water from this layer. In addition, plants may expend more energy to uptake water from deep compared to shallow soil layers (Schenk, 2008), especially when the deep soil layer exhibits lower SW."

Indeed, the previous sentence is inappropriate interpretation, mainly because the decreased deep soil water source may influenced by both previous soil water conditions and precipitation amount. In addition, the Table S3 in the previous manuscript is not the summary of relationship between rainfall amount and water source proportion from different soil layers. Therefore, we deleted the original sentence and rewritten these sentences mentioned above.

Tables and captions

Table S1. Plant height, trunk diameter, and estimated sapwood width for *H. rhamnoides* and *P. tomentosa* in both pure and mixed plantations.

Plantation type	No.	Height (m)	Trunk diameter (mm)	Sapwood width (mm)
H. rhamnoides in pure plantation	1	3.95	45	9
	2	4.26	53	11
	3	4.05	51	10
	4	4.13	49	9
	5	3.98	50	10
	6	4.1	51	11
	7	4.3	57	12
	8	3.86	44	9
	9	3.92	53	11
P. tomentosa in pure plantation	1	4.41	58	17
	2	3.9	52	9
	3	3.92	56	16
	4	4.35	56	17
	5	4.59	58	16
	6	4.2	53	13
	7	4.29	54	15
	8	3.86	51	9
	9	3.98	52	11
H. rhamnoides in mixed plantation	1	4.36	52	12
	2	3.9	49	11
	3	4.23	51	12
	4	4.5	56	13
	5	4.73	55	14
	6	3.96	49	11
	7	4	51	12
	8	4.52	53	12
	9	4.39	52	12
P. tomentosa in mixed plantation	1	4.12	53	11
	2	3.75	46	9
	3	4.5	57	13
	4	4.21	53	11
	5	4.2	53	11
	6	4.16	51	10
	7	3.8	45	9
	8	4.95	59	13
	9	4.16	51	10

The sapwood width was estimated through the equation established through 12 unmonitored individual core samples for specific species with different diameters. The core sample was obtained using an increment borer, and the colour difference between sapwood and heartwood was large. The equation between trunk diameter (mm) and sapwood width (mm) was $y=0.248x-2.296$ $R^2=0.84$ $p<0.01$ for *H. rhamnoides* in pure plantation; $y=0.348x-5.98$ $R^2=0.78$ $P<0.01$ for *H. rhamnoides* in mixed plantation; $y=1.126x-47.66$ $R^2=0.83$ $P<0.01$ for *P. tomentosa* in pure plantation; $y=0.317x-5.71$ $R^2=0.939$ $P<0.01$ for *P. tomentosa* in mixed plantation.

Table S2. Independent-sample *t*-test parameters for predawn (Ψ_{pd}), midday (Ψ_m), and gradient of leaf water potential ($\Psi_{pd} - \Psi_m$) between the first and second day after each rainfall amount.

	Rainfall amount (mm)	*df*	Ψ_{pd}		Ψ_m		$\Psi_{pd} - \Psi_m$	
			t	*p*	*t*	*p*	*t*	*p*
H. rhamnoides in pure plantation	3.4	4	0.18	0.87	1.21	0.29	-2.5	0.07
	7.9	4	0.33	0.75	0.79	0.58	-8.01	0.47
	15.4	4	0.85	0.44	0.27	0.8	0.21	0.85
	24	4	0.97	0.39	-0.67	0.54	2.13	0.1
	35.2	4	-0.09	0.93	-7.1	0.52	0.28	0.79
P. tomentosa in pure plantation	3.4	4	0.88	0.43	0.66	0.55	0.81	0.47
	7.9	4	0.34	0.08	0.75	0.49	-1.8	0.14
	15.4	4	0.23	0.83	0.73	0.51	-0.82	0.46
	24	4	-2.08	0.11	1.14	0.32	-0.85	0.45
	35.2	4	-1.67	0.17	1.15	0.31	-2.22	0.09
H. rhamnoides in mixed plantation	3.4	4	2.53	0.07	1.4	0.24	-0.6	0.58
	7.9	4	1.24	0.28	2.02	0.11	-1.87	0.14
	15.4	4	-0.9	0.42	0.96	0.39	-1.29	0.27
	24	4	1.74	0.16	2.04	0.11	-1.22	0.29
	35.2	4	1.89	0.13	2.57	0.06	-0.29	0.78
P. tomentosa in mixed plantation	3.4	4	0.07	0.95	1.9	0.13	-0.35	0.72
	7.9	4	0.81	0.46	0.96	0.39	-0.46	0.67
	15.4	4	0.7	0.52	2.12	0.1	-0.53	0.62
	24	4	1.85	0.14	0.74	0.49	0.48	0.66
	35.2	4	2.23	0.09	1.21	0.3	0.55	0.61

Table S3 The average (mean ± SD) and coefficients of variation (CVs, SD/mean) of soil water $\delta^{18}O$ and δD on the first day after 5 selected rainfall events, and daily soil water content (SW) from DOY 152 to 273 (1 June to 30 September) in *H. rhamnoides* pure plantation, *P. tomentosa* pure plantation, and *H. rhamnoides*–*P. tomentosa* mixed plantation.

	Soil depth	soil water $\delta^{18}O$ (‰)		soil water δD (‰)		SW (m^3 m^{-3})	
		average	CV	average	CV	average	CV
H. rhamnoides pure plantation	0–30 cm	-5.61±1.57	27.99	-41.53±11.68	28.12	0.13±0.025	19.23
	30–100 cm	-7.14±0.92	12.89	-52.37±6.47	12.35	0.1±0.012	12
	100–200 cm	-9.3±0.69	7.42	-68.66±3.53	5.14	0.09±0.006	6.67
P. tomentosa pure plantation	0–30 cm	-5.43±1.69	31.12	-42.08±11.91	28.3	0.13±0.026	20
	30–100 cm	-7.49±0.73	9.75	-51.34±4.56	8.88	0.09±0.008	8.89
	100–200 cm	-9.39±0.34	3.62	-67.36±3.79	5.63	0.08±0.005	6.25
Mixed plantation	0–30 cm	-5.68±1.73	30.46	-41.67±10.67	25.61	0.12±0.021	17.5
	30–100 cm	-6.57±1.08	16.44	-47.8±5.78	12.09	0.1±0.011	11
	100–200 cm	-9.07±0.5	5.51	-64.47±2.45	3.8	0.09±0.005	5.56

There are 45, 30, and 30 data for calculated the average water $\delta^{18}O$ and δD of shallow, middle, and deep soil layer in each plantation, respectively. The absolute value was used for CVs of soil water $\delta^{18}O$ and δD calculation.

Table S4. Repeated ANOVA (ANOVAR) parameters for the relative response of normalized sap flow (SF_R) and rainwater-recharged soil water uptake proportion (RUP) after rainfall pulses of *H. rhamnoides* and *P. tomentosa* (n = 30).

	Variation source	*df*	SF_R		RUP	
			F	*p*	*F*	*p*
Pure plantation	Rainfall	4	97.91	<0.001	385.02	<0.01
	Species	1	121.13	<0.001	21.02	<0.05
	Rainfall × Species	4	27.35	<0.001	0.83	0.52
Mixed plantation	Rainfall	4	489.9	<0.001	17696.38	<0.01
	Species	1	70.38	<0.001	4089.12	<0.01
	Rainfall × Species	4	249.17	<0.001	1776.62	<0.01
H. rhamnoides	Rainfall	4	42.63	<0.001	496.72	<0.01
	Plantation type	1	337.09	<0.001	360.16	<0.01
	Rainfall × Plantation type	4	215.43	<0.001	17.62	<0.01
P. tomentosa	Rainfall	4	10.05	<0.001	1969.3	<0.01
	Plantation type	1	32.36	<0.01	54.83	<0.01
	Rainfall × Plantation type	4	19.12	<0.001	208.06	<0.01

df = degree of freedom, Plantation type = pure and mixed plantation for each species. Pure and Mixed plantation indicate the result of SF_R and RUP for both species in different plantation types, respectively; *H. rhamnoides* and *P. tomentosa* indicate the mixed afforestation effect on SF_R and RUP for these species.

Table S5. Repeated ANOVA (ANOVAR) parameters for water uptake proportion from shallow (0–30 cm), middle (30–100 cm), and deep (100–200 cm) soil layer for *H. rhamnoides* and *P. tomentosa* (n = 30).

	Variation source	*df*	0–30cm		30–100cm		100–200cm	
			F	*p*	*F*	*p*	*F*	*p*
Pure plantation	Rainfall	4	153.45	<0.01	145.04	<0.01	176.79	<0.01
	Species	1	8.69	<0.05	10.56	<0.05	11.08	<0.05
	Rainfall × Species	4	129.89	<0.01	112.46	<0.01	4.99	<0.01
Mixed plantation	Rainfall	4	1.5	0.41	2.3	0.11	18.34	<0.01
	Species	1	2.2	0.21	1.48	0.29	3.9	0.12
	Rainfall × Species	4	0.9	0.48	2.41	0.09	1.9	0.16
H. rhamnoides	Rainfall	4	2.05	0.14	1.51	0.25	85.46	<0.01
	Plantation type	1	1.07	0.36	1.32	0.32	10.08	<0.05
	Rainfall × Plantation type	4	0.62	0.66	1.39	0.28	5.59	<0.01
P. tomentosa	Rainfall	4	14.72	<0.01	71.59	<0.01	19.46	<0.01
	Plantation type	1	4.1	0.12	5.68	0.08	123.27	<0.01
	Rainfall × Plantation type	4	9.55	<0.01	85.29	<0.01	9.35	<0.01

df = degree of freedom, Plantation type = pure and mixed plantation for each species. Pure and Mixed plantation indicate the result of water sources from different soil layers for both species in different plantation types, respectively; *H. rhamnoides* and *P. tomentosa* indicate the mixed afforestation effect on water sources from different soil layers for these species.

Table S6. Repeated ANOVA (ANOVAR) parameters for predawn (Ψ_{pd}), midday leaf water potential (Ψ_m), and leaf water potential gradient (Ψ_{pd}–Ψ_m) for *H. rhamnoides* and *P. tomentosa* (n = 30).

	Variation source	*df*	Ψ_{pd}		Ψ_m		$\Psi_{pd}-\Psi_m$	
			F	*p*	*F*	*p*	*F*	*p*
Pure plantation	Rainfall	4	4.02	<0.05	24.44	<0.01	47.88	<0.01
	Species	1	182.74	<0.01	4.9	<0.05	969.97	<0.01
	Rainfall × Species	4	3.24	<0.05	2.08	0.13	18.68	<0.01
Mixed plantation	Rainfall	4	0.66	0.63	25.54	<0.01	82.49	<0.01
	Species	1	0.12	0.75	127.3	<0.01	3420.1	<0.01
	Rainfall × Species	4	1.8	0.18	3.7	<0.05	35.92	<0.01
H. rhamnoides	Rainfall	4	7.14	<0.01	19.64	<0.01	3.59	<0.05
	Plantation type	1	27.05	<0.01	496.66	<0.01	1278.96	<0.01
	Rainfall × Plantation type	4	1.69	0.202	3.32	<0.05	6.66	<0.01
P. tomentosa	Rainfall	4	30.78	<0.01	12.39	<0.01	7.38	<0.01
	Plantation type	1	792.77	<0.01	2.97	0.16	634.12	<0.01
	Rainfall × Plantation type	4	3.8	<0.05	0.09	0.98	3.83	<0.05

df = degree of freedom, Plantation type = pure and mixed plantation for each species. Pure and Mixed plantation indicate the result of leaf water potential for both species in different plantation types, respectively; *H. rhamnoides* and *P. tomentosa* indicate the mixed afforestation effect on leaf water potential for these species.

Table S7. Regression of reference evapotranspiration (ET_0) and relative response of normalized sap flow (SF_R).

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
ET_0	0.18	0.47	0.11	0.59	0.44	0.22	0.39	0.26
Relative response of ET_0	0.35	0.32	0.61	0.12	0.12	0.56	0.25	0.4

The regression equation is y=ax+b for all equations in this Table. Relative response of ET_0 is calculated as the same SF_R in Eq. (4) in the manuscript, with before and the first day after rainfall event parameter is ET_0 instead.

Table S8. Parameters of allometric equation and average (mean ± SD) estimated biomass of leaf, branches, wood, and roots of *H. rhamnoides* and *P. tomentosa* in pure and mixed plantations (n=6).

Species		*a*	*b*	Biomass in pure plantation	Biomass in mixed plantation
	leaf	0.017	0.541	0.51 ±0.02	0.55 ±0.04
	branches	0.013	0.042	0.16 ±0.05	0.14 ±0.01
H. rhamnoides	wood	0.036	0.721	2.4 ±0.09	2.6 ±0.07
	roots	0.019	0.732	1.51 ±0.06	1.79 ±0.04
	total biomass			4.58 ±1.01	5.08 ±1.13
	leaf	0.052	0.621	1.21 ±0.05	1.58 ±0.09
	branches	0.025	0.81	1.35 ±0.04	1.32 ±0.06
P. tomentosa	wood	0.0492	0.832	4.22 ±0.11	4.73 ±0.13
	roots	0.031	0.791	2.02 ±0.06	2.75 ±0.1
	total biomass			8.8 ±1.39	10.38 ±1.55

The allometric equation is $Y=a(D^2H)^b$, Y is biomass (kg), D is trunk diameter measured at 1.3 m above the ground (cm), H is tree height (m). Six standard individuals of *H. rhamnoides* and *P. tomentosa* in pure and mixed plantations were selected for average Y calculation.