

**Table S1.** Preliminary study measures of biomass, gas exchange and mineral composition under well-watered (WW) and water-stressed conditions (WS) in *Medicago sativa* plants. Gas exchange determinations: photosynthetic rates (A), transpiration (E), stomatal conductance (gs), and substomatic CO<sub>2</sub> concentration (Ci). Each value represents the mean  $\pm$ SE (n=6). The different letters indicate significant differences ( $p < 0.05$ ).

		Total Biomass (g DW plant <sup>-1</sup> )	Gas exchange measures				Mineral composition and isotopes		
			A ( $\mu\text{mol m}^{-2} \text{s}^{-1}$ )	E ( $\text{mmol H}_2\text{O m}^{-2} \text{s}^{-1}$ )	gs ( $\text{mmol H}_2\text{O m}^{-2} \text{s}^{-1}$ )	Ci ( $\mu\text{mol mol}^{-1}$ )	Leaf N (%)	Leaf C (%)	Carbon isotope fraction ( $\delta^{18}\text{O}$ )
San Isidro	WW	1.69 $\pm$ 0.39	10.83 $\pm$ 1.38	1.49 $\pm$ 0.18	111.2 $\pm$ 13.69	237.6 $\pm$ 4.32	2.60 $\pm$ 0.07	42.38 $\pm$ 0.34	-33.23 $\pm$ 0.27
	WS	1.64 $\pm$ 0.26	2.74 $\pm$ 0.52	0.29 $\pm$ 0.07	22.04 $\pm$ 5.04	180.1 $\pm$ 28.73	2.73 $\pm$ 0.11	41.05 $\pm$ 0.49	-32.78 $\pm$ 0.18
Zhong Mu	WW	1.96 $\pm$ 0.46	8.63 $\pm$ 0.67	1.23 $\pm$ 0.06	92.13 $\pm$ 4.58	245.0 $\pm$ 5.54	2.74 $\pm$ 0.16	42.47 $\pm$ 0.20	-33.48 $\pm$ 0.20
	WS	1.23 $\pm$ 0.38	4.85 $\pm$ 0.59	0.51 $\pm$ 0.08	38.53 $\pm$ 6.74	181.7 $\pm$ 20.68	2.69 $\pm$ 0.15	42.18 $\pm$ 0.35	-32.65 $\pm$ 0.31
Giulia	WW	1.89 $\pm$ 0.61	9.81 $\pm$ 0.47	1.38 $\pm$ 0.05	105.8 $\pm$ 4.91	241.9 $\pm$ 12.34	3.39 $\pm$ 0.15	42.50 $\pm$ 0.48	-33.13 $\pm$ 0.29
	WS	1.67 $\pm$ 0.39	3.75 $\pm$ 0.60	0.49 $\pm$ 0.08	36.60 $\pm$ 5.92	231.0 $\pm$ 7.93	2.58 $\pm$ 0.12	41.73 $\pm$ 0.44	-32.89 $\pm$ 0.18
Europa	WW	1.31 $\pm$ 0.26	7.84 $\pm$ 1.12	1.06 $\pm$ 0.17	81.49 $\pm$ 13.08	235.3 $\pm$ 15.69	3.11 $\pm$ 0.10	42.68 $\pm$ 0.40	-33.24 $\pm$ 0.30
	WS	1.54 $\pm$ 0.28	2.74 $\pm$ 0.58	0.38 $\pm$ 0.08	28.40 $\pm$ 6.05	241.3 $\pm$ 2.12	2.69 $\pm$ 0.20	41.72 $\pm$ 0.30	-32.92 $\pm$ 0.27
Aragón	WW	2.14 $\pm$ 0.31	8.11 $\pm$ 0.65	1.32 $\pm$ 0.18	101.7 $\pm$ 15.65	258.9 $\pm$ 11.67	2.82 $\pm$ 0.20	41.80 $\pm$ 0.47	-33.49 $\pm$ 0.18
	WS	1.75 $\pm$ 0.30	2.30 $\pm$ 0.76	0.28 $\pm$ 0.14	21.22 $\pm$ 10.69	212.0 $\pm$ 23.25	2.98 $\pm$ 0.21	41.43 $\pm$ 0.29	-32.90 $\pm$ 0.17
Long Mu 803	WW	1.51 $\pm$ 0.26	8.05 $\pm$ 1.09	1.18 $\pm$ 0.16	89.40 $\pm$ 13.77	247.7 $\pm$ 3.63	2.90 $\pm$ 0.11	41.83 $\pm$ 0.25	-33.41 $\pm$ 0.14
	WS	1.84 $\pm$ 0.43	2.28 $\pm$ 0.80	0.27 $\pm$ 0.14	20.75 $\pm$ 10.36	225.7 $\pm$ 50.79	3.08 $\pm$ 0.12	41.32 $\pm$ 0.15	-32.85 $\pm$ 0.14
Dongmung I	WW	1.62 $\pm$ 0.45	9.98 $\pm$ 0.93	1.53 $\pm$ 0.24	119.1 $\pm$ 20.21	253.3 $\pm$ 13.35	3.19 $\pm$ 0.16	42.24 $\pm$ 0.64	-32.77 $\pm$ 0.31
	WS	1.74 $\pm$ 0.35	2.79 $\pm$ 1.04	0.40 $\pm$ 0.14	29.93 $\pm$ 10.37	276.0 $\pm$ 22.99	3.07 $\pm$ 0.18	42.10 $\pm$ 0.50	-33.22 $\pm$ 0.13
Zhao Long	WW	1.56 $\pm$ 0.41	10.37 $\pm$ 0.45	1.52 $\pm$ 0.06	115.6 $\pm$ 5.07	248.2 $\pm$ 11.88	3.26 $\pm$ 0.20	41.88 $\pm$ 0.40	-32.76 $\pm$ 0.35
	WS	1.23 $\pm$ 0.18	2.25 $\pm$ 0.50	0.36 $\pm$ 0.05	26.45 $\pm$ 4.03	262.1 $\pm$ 14.40	2.77 $\pm$ 0.08	41.98 $\pm$ 0.26	-33.37 $\pm$ 0.23

**Table S2.** Gas exchange determinations: photosynthetic rates (A), transpiration (E), stomatal conductance (gs), and substomatic CO<sub>2</sub> concentration (Ci) of *Medicago sativa* plants under well-watered (WW) and water-stressed conditions (WS). Measurements were conducted at the end of the experiment. Each value represents the mean  $\pm$ SE ( $n = 6$ ). The different letters indicate significant differences ( $p < 0.05$ ).

<i>Gas exchange</i>	San Isidro		Zhong Mu	
	WW	WS	WW	WS
A ( $\mu\text{mol m}^{-2} \text{s}^{-1}$ )	11.99 $\pm$ 0.60 a	3.51 $\pm$ 0.40 b	10.45 $\pm$ 0.80 a	4.64 $\pm$ 0.55 b
E ( $\text{mmol H}_2\text{O m}^{-2} \text{s}^{-1}$ )	1.64 $\pm$ 0.08 a	0.40 $\pm$ 0.04 b	1.41 $\pm$ 0.07 a	0.58 $\pm$ 0.10 b
gs ( $\text{mmol H}_2\text{O m}^{-2} \text{s}^{-1}$ )	122.69 $\pm$ 6.16 a	29.87 $\pm$ 2.63 b	104.31 $\pm$ 5.47 a	43.79 $\pm$ 7.86 b
Ci ( $\mu\text{mol mol}^{-1}$ )	235.90 $\pm$ 4.34 a	205.94 $\pm$ 25.71 b	233.52 $\pm$ 6.35 a	205.30 $\pm$ 29.59 b