Appendix A

Table A1. The main and combined effects of water supply (control, drought), community (*L perenne* monoculture, *T repens* monoculture, *C intybus* monoculture, *T pratense* monoculture, equi-proportional mixture) and soil depth interval (0-10, 10-20, 20-30, 30-40 cm*) on the soil moisture content and the $\delta^{18}0$ of soil water in Tänikon 2011 and Reckenholz 2012.

	Tänikon 2011					Reckenholz 2012				
		SMC		$\delta^{18}0$ soil water			SMC		$\delta^{18}0$ soil water	
Model*	df	F-value	*p*	F-value	*p*	df	F-value	*p*	F-value	*p*
Water supply	1	53.3	***	136.1	***	1	627.2	***	77.0	***
Community	4	0.6	ns	4.3	*	4	4.2	0.06	3.2	ns
Depth	3	3.6	*	68.1	***	4	13.8	***	105.1	***
Water supply × Community	4	0.6	ns	0.3	ns	4	2.3	ns	2.3	ns
Water supply × Depth	3	34.2	***	29.7	***	4	39.1	***	7.1	***
Community × Depth	12	0.8	ns	1.5	ns	16	0.5	ns	2.4	**
Water supply × Community × Depth	12	0.5	ns	0.5	ns	16	1.8	0.07	2.0	*

*During 2012, the 0-10 cm soil depth interval was split into 0-5 and 5-10 cm

Table A2. The main and combined effects of water supply (control, drought) and community (*L perenne* monoculture, *T repens* monoculture, *C intybus* monoculture, *T pratense* monoculture, equi-proportional mixture) on aboveground dry matter yield in Tänikon 2011 and Reckenholz 2012.

		Tänikon 2011		Reckenholz 2012	
Model	df	F-value	*p*	F-value	*p*
Water supply	1	7.3	*	41.7	***
Community	4	28.5	***	47.4	***
Water supply × Community	4	1.7	ns	2.7	0.08

Table A3. The main and combined effects of water supply (control, drought) and species (*L perenne*, *T repens*, *C intybus*, *T pratense*) on the proportional contribution of each species to the dry matter yield of the equi-proportional mixture in Tänikon 2011 and Reckenholz 2012.

Year		Tänikon 2011		Reckenholz 2012	
Model	df	F-value	*p*	F-value	*p*
Water supply	1	0.0	ns	0.0	ns
Species	3	42.3	***	14.0	***
Water supply × Species	3	3.8	*	0.2	ns

Table A4. The main and combined effects of water supply (control, drought), diversity (monoculture, mixture) and species* (*L perenne*, *T repens*, *C intybus*, *T pratense*) on the proportional water uptake from the 0-10 cm soil depth interval ($PCWU_{0\text{-}10}$) and the inferred depth of water uptake in Tänikon 2011 and Reckenholz 2012.

			Proportional uptake from 0-10 cm		Inferred depth of water uptake	
Year	Model	df	F-value	*p*	F-value	*p*
2011	Water supply	1	0.0	ns	0.5	ns
	Diversity	1	92.8	**	6.4	0.06
	Water supply × Diversity	1	29.4	*	0.4	ns
2012	Water supply	1	4.5	0.07	0.0	ns
	Species	3	10.9	**	12.3	**
	Diversity	1	0.0	ns	0.2	ns
	Water supply × Species	3	1.3	ns	1.8	ns
	Water supply × Diversity	1	0.0	ns	0.1	ns
	Species × Diversity	3	10.0	**	5.7	*
	Water supply × Species × Diversity	3	3.7	0.05	1.9	ns

*For 2011, only data for one species (*T pratense*) were available, and the factor species was omitted from the model.

Table A5. The main and combined effects of water supply (control, drought), diversity (monoculture, mixture) and species pair (*L perenne–T repens, L perenne–C intybus, L perenne–T pratense; T repens–C intybus, T repens–T pratense* and *C intybus–T pratense*) or rooting-depth pair (shallow, mixed, deep*) on the proportional similarity of the proportional water uptake from the 0-10 cm and 10-40 cm soil depth intervals in Reckenholz 2012.

	df	F-value	*p*		df	F-value	*p*
Water supply	1	0.8	ns	Water supply	1	0.9	ns
Diversity	1	0.0	ns	Diversity	1	0.0	ns
Species pair	5	2.4	0.05	RD pair	2	5.8	**
Water supply × Diversity	1	3.0	ns	Water supply × Diversity	1	1.8	ns
Diversity × Species pair	5	7.5	***	Diversity × RD pair	2	9.1	***
Water supply × Species pair	5	5.3	**	Water supply × RD pair	2	2.3	ns

*Rooting-depth pairs: shallow (*L perenne–T repens),* mixed (*L perenne–C intybus, L perenne–T pratense, T repens–C intybus, T repens–T pratense*) and deep (*C intybus–T pratense*).

Appendix B

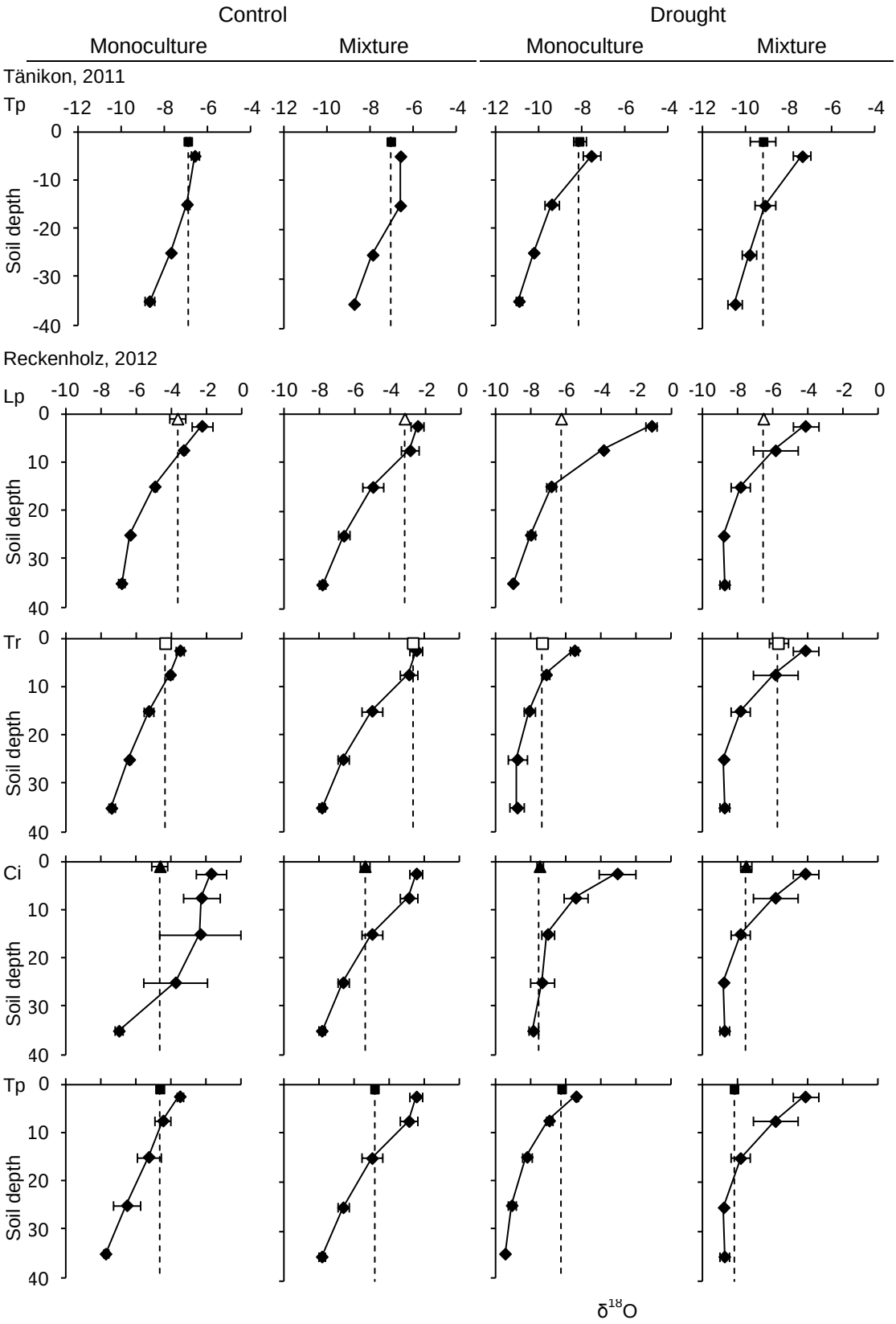

Figure B1. Mean (±SE, *n* = 2 for all soils and plants, *n* = 1 for plants in the case of Tänikon-*T pratense*-Control-Mixture and Reckenholz-*T repens*-Control-Mixture) $\delta^{18}O$ values of soil water (⎯ , ◆) and plant xylem water for the shallow rooting (Lp = *L perenne* △ and Tp = *T repens* □) and deep rooting (Ci = *C intybus* ▲and Tp = *T pratense* ■) species grown in monoculture or mixture under control or drought conditions in Tänikon, 2011 and Reckenholz, 2012. The point at which the $\delta^{18}O$ signature of the plant xylem (- -) intersects with the soil water $\delta^{18}O$ line (⎯) corresponds to the estimated mean depth of water uptake (see Fig. 2a-e).

Appendix C

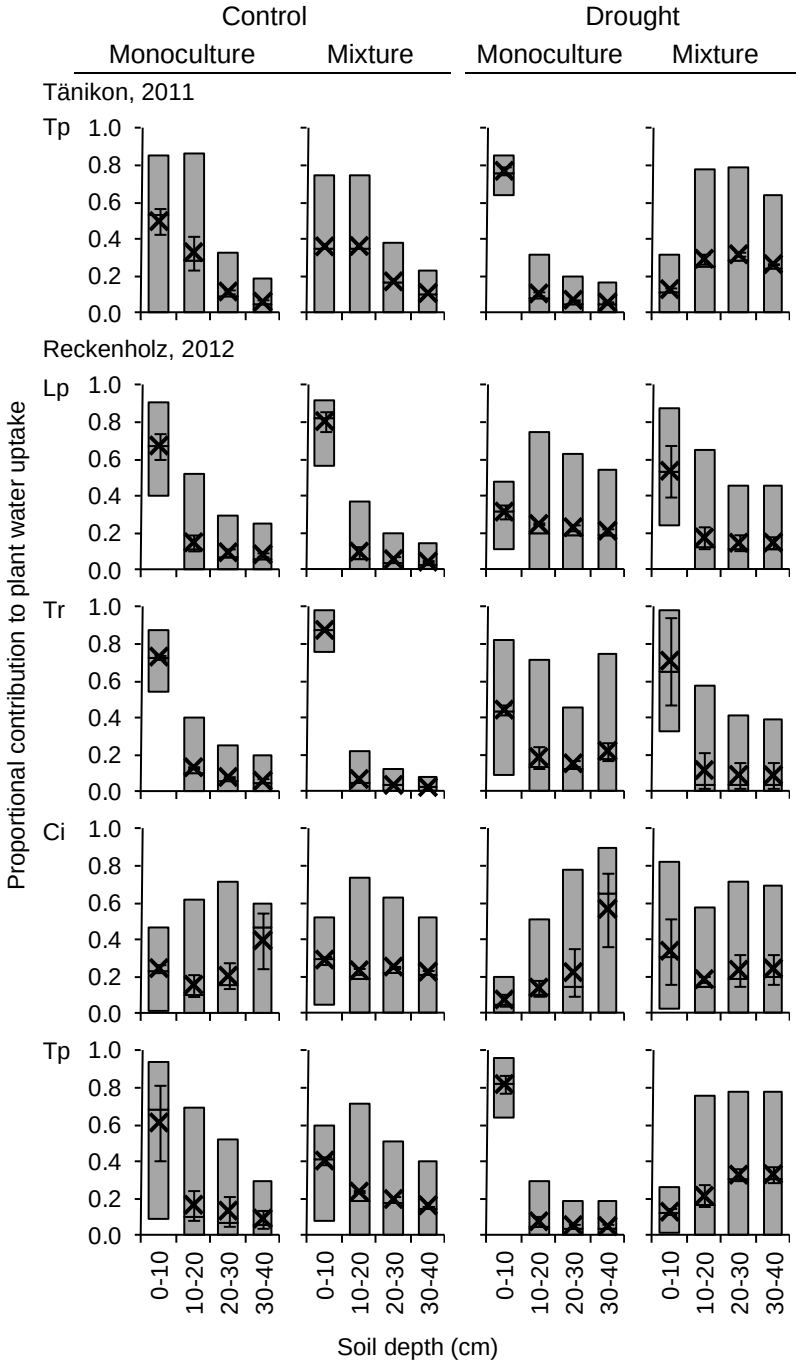

Figure C1. Box plots of the proportional contribution of each soil layer (0-10, 10-20, 20-30 and 30-40 cm) to plant water uptake of the shallow rooting species (Lp = *L perenne* and Tr = *T repens*) and the deep rooting species (Ci = *C intybus* and Tp = *T pratense*) grown in monoculture or mixture under control and drought conditions in Tänikon (2011) or Reckenholz (2012). Lower, middle and upper boundaries of the bars represent the 1st percentile, 50th percentile and 99th percentile of the proportional contribution, respectively. The mean (×) and SE of the mean proportional contribution (n = 2 in all cases except for Tänikon-*T pratense*-control-mixture and Reckenholz-*T repens*-control-mixture, where n = 1) are also included.