



Supplement of

Routing stemflow water through the soil via preferential flow: a dual-labelling approach with artificial tracers

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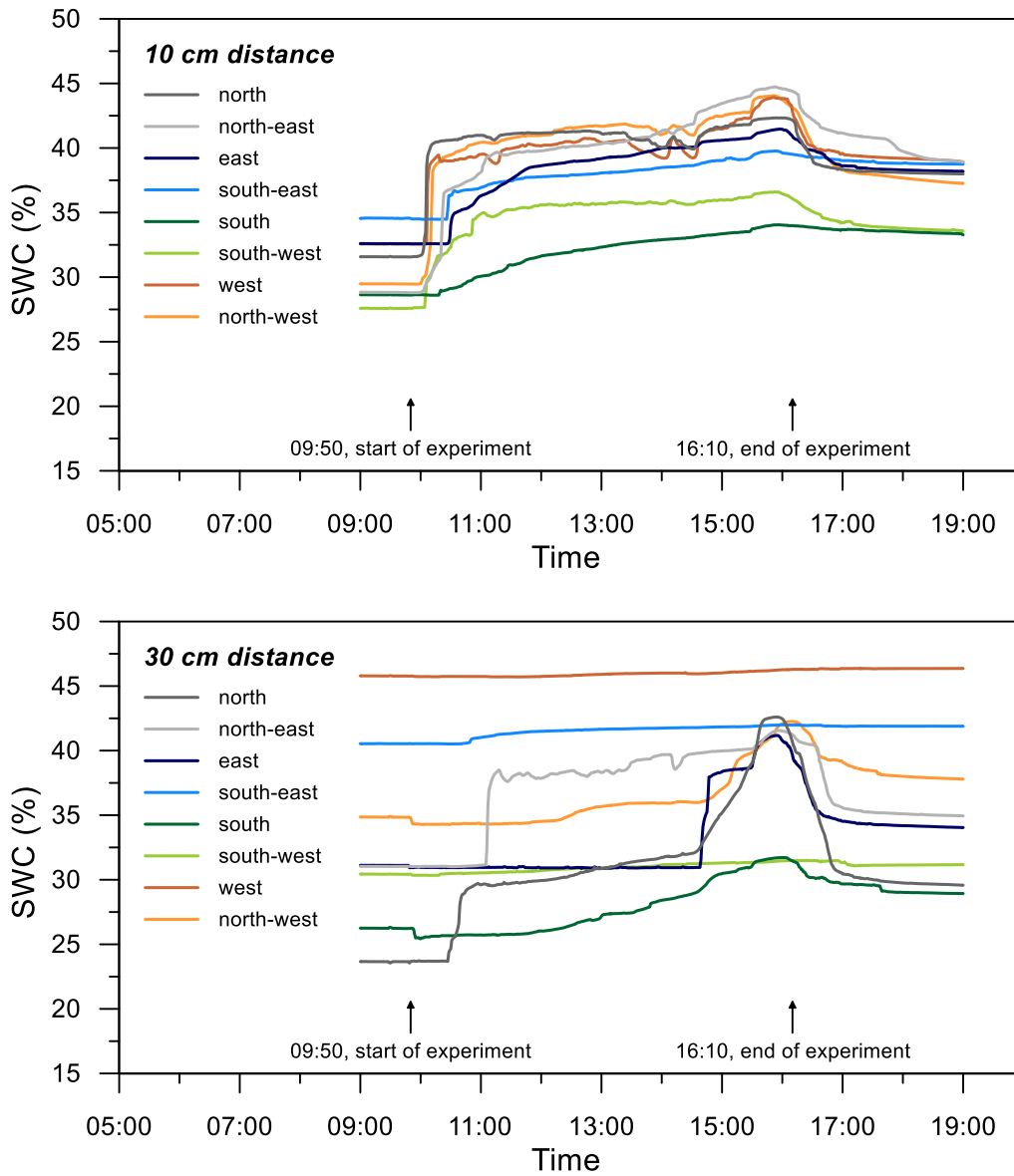


Figure S1. Temporal evolution of volumetric soil water content (SWC) at 1-min resolution derived from TDR sensors along the four cardinal and the four intercardinal directions at 10 cm distance to the trunk (top) and 30 cm distance (bottom).

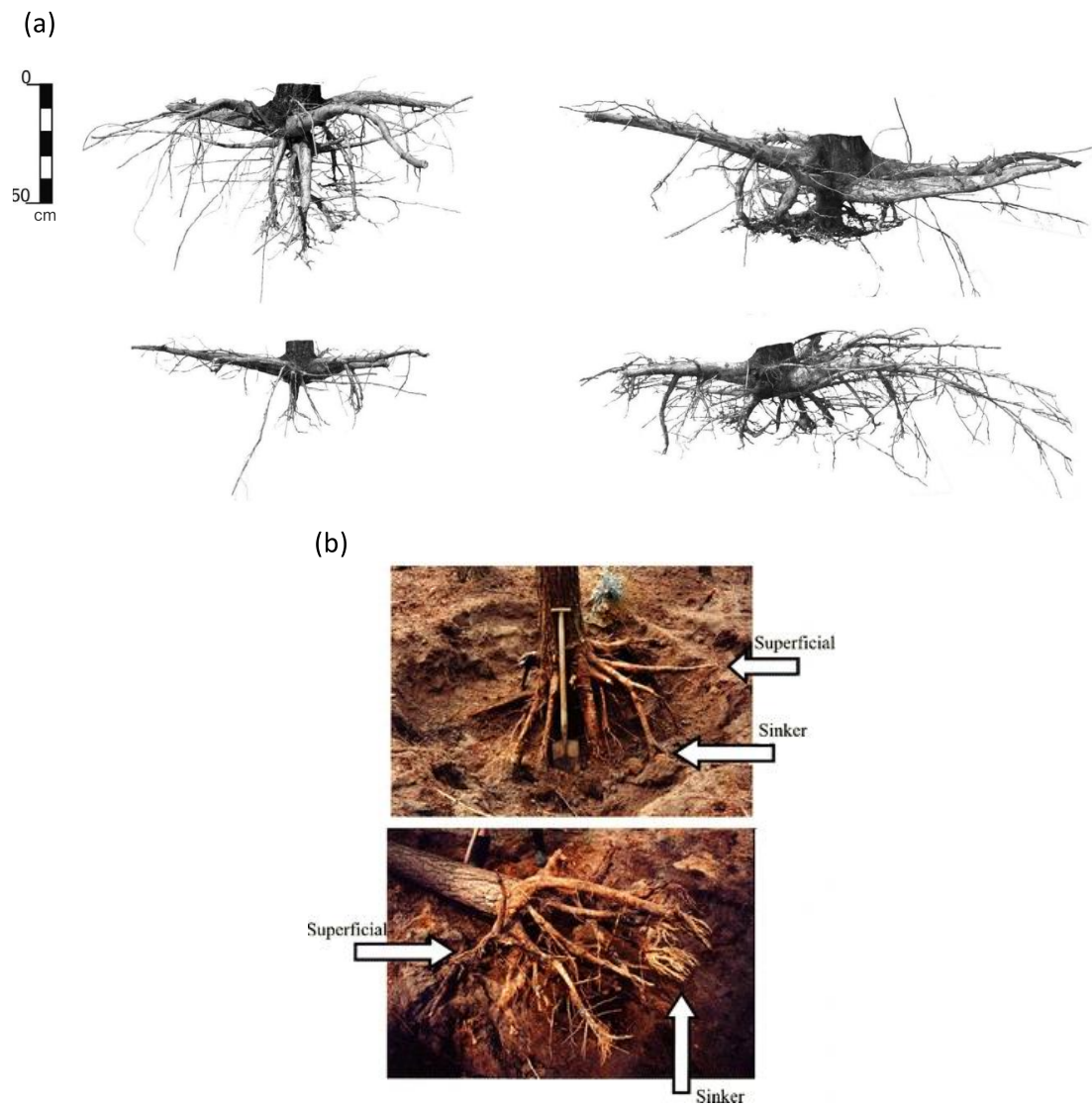


Figure S2. Examples of Scots pine root system architecture. Source (a) Pietrzykowski et al. (2017), *Forest Research Papers*, 78, 323–331. <https://doi.org/10.1515/frp-2017-0036>; and (b) Čermák et al. (2008), *Plant and Soil*, 305(1), 61–75. <https://doi.org/10.1007/s11104-007-9433-z>. Figures are reproduced based on open access Creative Commons Attribution License.



Figure S3. Dye colored water observed at mini-piezometer wt-W20, located next to the west TDR probe (30 cm distance from tree trunk; swc-W30).

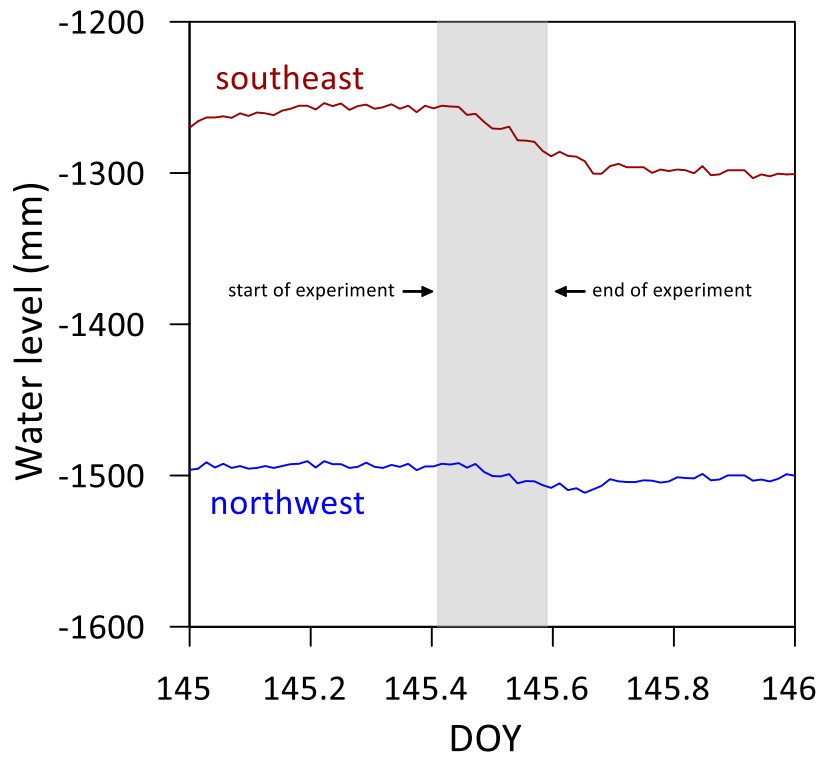


Figure S4. Dynamics of groundwater table at 20 min resolution in the southeast and northwest deep piezometers. Gray area indicates the time period of the stemflow experiment. DOY = day of the year.

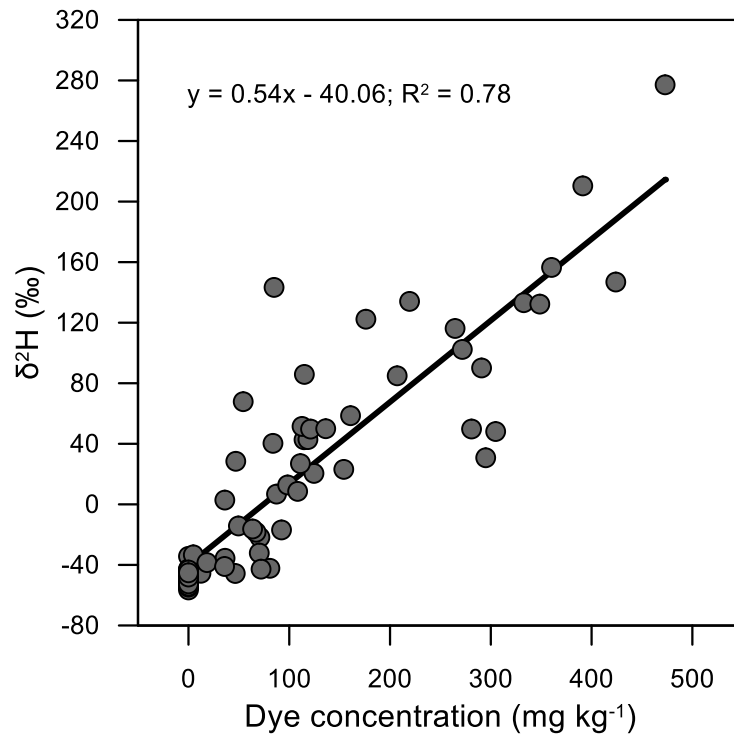


Figure S5. Relationship between deuterium isotopic composition and Brilliant Blue FCF dye concentration for the 63 soil samples taken from the 12 profiles excavated after the stemflow experiment.

Table S1. Maximum concentrations of Brilliant Blue FCF and deuterium isotopic compositions in soil profiles for the different cardinal directions and distances from the trunk.

Profile	Distance from the tree trunk (cm)	<i>n</i>	Brilliant Blue FCF	Deuterium
			Max.	
			mg kg ⁻¹ soil	‰
PN1	40	8	92.33	-14.27
PN2	25	6	176.04	122.30
PN3	10	6	472.96	277.14
PE1	40	6	124.52	51.47
PE2	25	5	280.89	102.32
PE3	10	4	348.63	132.27
PS1	40	6	114.65	42.69
PS2	25	6	154.11	23.09
PS3	10	6	332.68	134.06
PW1	40	2	0	-51.53
PW2	25	4	360.28	156.49
PW3	10	4	391.26	210.35

n indicates the number of samples.

Table S2. Brilliant Blue FCF dye concentration of the water samples taken from the mini-piezometers (wt) during the stemflow experiment.

Time	NW20	N50	N20	NE20	E20	E50	SE20	S20	S50	SW20	W20	W50
	Brilliant Blue FCF dye concentration (g L⁻¹)											
10:45	†	†	†	†	†	†	†	†	†	†	†	†
11:50	†	†	†	‡	†	†	4.96	‡	†	†	‡	†
12:45	†	†	†	‡	‡	†	4.74	4.59	†	†	5.40	†
13:45	†	†	†	5.34	‡	†	5.11	4.86	†	‡	5.80	†
14:45	†	†	†	5.89	‡	†	5.52	5.31	†	‡	5.77	†
15:45	†	†	‡	6.31	‡	‡	5.97	5.60	†	‡	5.89	†

† Denotes that no water was recorded and ‡ that the level was not sufficient for a sample to be taken.