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## Supplementary Material

### **Root responses of triticale and soybean to soil compaction in the field are reproducible under controlled conditions**

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**Table S1. Treatment means of root architectural traits 42 and 91 DAS from field grown triticale under top soil compaction (TSCom), sub soil compaction (SSCom) and without compaction (Ctrl) and field grown soybean on compacted soil with shallow tillage (Com) and without compaction (Ctrl); different letters indicate significant differences of the means based on ANOVA with least significant test at *P*-level 0.05 (*n*=3)**

NR<sub>No1</sub>= nodal root from the first whorl, NR<sub>No3</sub>= nodal root from the third whorl, TR= tap root, AR= adventitious root, LR= lateral root

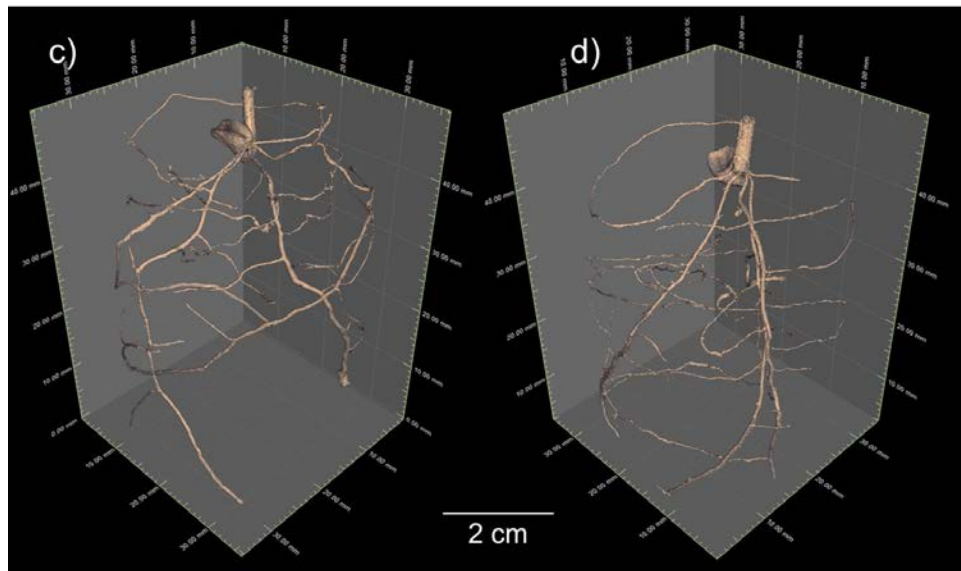
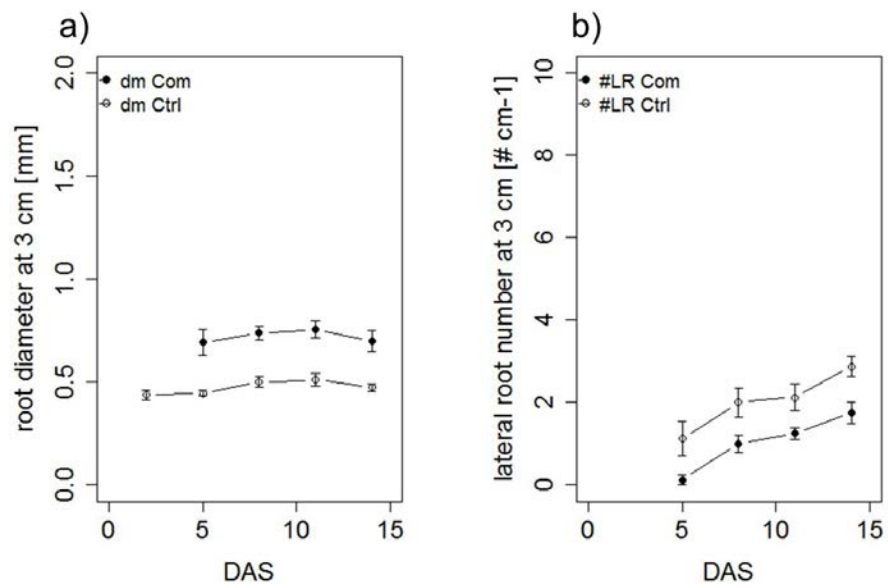
	Triticale						Soybean				
DAS	Trait	Root	Distance from root base [cm]	TSCom	SSCom	Ctrl	Trait	Root	Distance from root base [cm]	Com	Ctrl
42	Diameter [mm]	NR <sub>No1</sub>	10	NA	NA	NA	Diameter [mm]	TR	10	0.720 <sup>a</sup>	1.478 <sup>b</sup>
								AR	10	0.613	0.531
	Number of LR [# cm <sup>-1</sup> ]	NR <sub>No1</sub>	9–11	NA	NA	NA	Number of LR [# cm <sup>-1</sup> ]	TR	9–11	3.667	5.333
								AR	9–11	4.583	3.583
91	Diameter [mm]	NR <sub>No1</sub>	10	0.715 <sup>a</sup>	0.631 <sup>a</sup>	0.517 <sup>b</sup>	Diameter [mm]	TR	10	0.935 <sup>a</sup>	2.225 <sup>b</sup>
		NR <sub>No3</sub>	5	NA	0.873 <sup>a</sup>	0.612 <sup>b</sup>		AR	10	0.906	0.966
			10	NA	0.555	0.485					
	Number of LR [# cm <sup>-1</sup> ]	NR <sub>No1</sub>	9–11	2.069 <sup>a</sup>	2.583 <sup>a</sup>	4.069 <sup>b</sup>	Number of LR [# cm <sup>-1</sup> ]	TR	9–11	3.444 <sup>a</sup>	6.167 <sup>b</sup>

								AR	9-11	5.167	4.625
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**Table S2. Treatment means of root architectural and anatomical traits and plant vigour traits 14 days after sowing of winter wheat grown under controlled conditions in compacted (Com) and loose soil (Ctrl); different letters indicate significant differences of the means based on ANOVA with least significant test at *P*-level 0.05 (*n* = 4); abbreviations cf. Table 1.**

NR= nodal root, PR= primary root, LR=lateral root, DW= dry weight

Trait	Root	Distance from root base [cm]	Com	Ctrl
Number of NR	NR		0.5	0
Diameter [mm]	PR	3	0.68	0.478
Diameter [mm]	SR	3	0.698 <sup>a</sup>	0.472 <sup>b</sup>
Number of LR [# cm <sup>-1</sup> ]	PR	4–6	1	2.75
Number of LR [# cm <sup>-1</sup> ]	SR	4–6	1.750 <sup>a</sup>	2.875 <sup>b</sup>
ArV [mm <sup>2</sup> ]	PR	3	0.0421	0.0441
ArC [mm <sup>2</sup> ]	PR	3	0.241	0.168
ArCP [%]	PR	3	84.92	73.59
ArC/ArV	PR	3	5.859	4.059
RCA [%]	PR	3	21.530 <sup>a</sup>	6.397 <sup>b</sup>
Shoot DW [g]			0.0284 <sup>a</sup>	0.0531 <sup>b</sup>
Root DW [g]			0.0226	0.0246
Root-shoot ratio			0.873	0.464
SPAD			38.05	43.55



**Fig. S1.** (a) Root diameters (dm) of wheat seminal roots and (b) lateral root number (#LR) at wheat seminal roots grown under compacted (Com) and loosely (Ctrl) packed soil and measured 2, 5, 8, 11 and 14 days after sowing (DAS); error bars represent standard errors ( $n=4$ ); typical pictures of triticale roots from (a) Com and (b) Ctrl.