

## Supplementary Material

Table 1S Characteristics of the root system of the five wheat cultivars used in this study. Data are from a previous semi-hydroponic phenotyping study, measured in four plants per genotype at the onset of tillering (Z2.1)

Name	Seminal root number	Total root length (cm plant <sup>-1</sup> )	Root biomass (mg plant <sup>-1</sup> )	Maximum root depth (cm)	Root size category
Bahatans-87	12	3191	278	123	Large
Ghurka	10	3104	293	122	Large
Hartog	10	1926	138	109	Medium
Harper	9	915	55	85	Small
Tincurrin	6	670	51	86	Small

**Table 2S** Cumulative root length of five cultivars measured by root mapping (non-invasive) at 7, 14, 21, 28, 35, 42, 49, 56 and 63 days after sowing (DAS).

Cultivars	Cumulative root length (m)								
	7 DAS	14 DAS	21 DAS	28 DAS	35 DAS	42 DAS	49 DAS	56 DAS	63 DAS
Ghurka	0.31	0.81	1.42	2.24	3.46 b	6.28 ab	8.06 ab	10.78 ab	11.94 ab
Tincurrin	0.22	0.52	1.09	1.85	3.36 b	6.10 ab	7.59 ab	8.32 c	10.07 cd
Hartog	0.29	0.75	1.23	1.95	3.33 b	5.78 ab	6.98 b	7.40 c	9.08 d
Harper	0.30	0.62	0.97	1.52	3.05 b	5.24 b	7.27 b	9.41 b	10.75 bc
Bahatans-87	0.26	0.76	1.45	2.13	4.50 a	7.13 a	8.84 a	10.93 a	12.50 a
LSD $P<0.05$	ns	ns	ns	ns	1.01	1.51	1.29	1.39	1.55

Data with the same letter indicate no significant difference between cultivars ( $P<0.05$ ), ns= not significant.

**Table 3S.** Root biomass (RB), root length density (RLD) and specific root length (SRL) down the soil profile at harvest at 63 DAS. Measurements were made destructively in 0.2 m sections from the top to the bottom of each rhizobox.

Soil depth (m)	Cultivar	RB (g)	RLD (cm cm <sup>-3</sup> )	SRL (m g <sup>-1</sup> )
0 - 0.2	Ghurka	0.84 a	21.84 ab	172 d
	Tinticurrin	0.48 b	17.21 cd	240 a
	Hartog	0.52 b	15.94 d	206 bc
	Harper	0.70 a	21.06 bc	181 cd
	Bahatans-87	0.72 a	25.67 a	215 ab
	LSD $P<0.05$	0.18	4.09	33

0.2 - 0.4	Ghurka	0.66 a	12.39 a	125 bc
	Tinticurrin	0.36 c	9.41 b	177 a
	Hartog	0.44 bc	10.10 b	157 ab
	Harper	0.44 bc	11.46 ab	159 ab
	Bahatans-87	0.58 ab	9.90 b	104 c
	LSD $P<0.05$	0.18	2.08	43
0.4-0.6	Ghurka	0.28 b	6.24 a	118 ab
	Tinticurrin	0.18 bc	4.77 ab	168 a
	Hartog	0.15 c	3.30 b	150 ab
	Harper	0.25 b	5.48 ab	130 ab
	Bahatans-87	0.47 a	6.91 a	90 b
	LSD $P<0.05$	0.17	2.72	63
0.6-0.8	Ghurka	0.07 b	0.73 b	79
	Tinticurrin	0.03 b	0.53 b	83
	Hartog	0.01 b	0.12 b	69
	Harper	0.04 b	0.39 b	71
	Bahatans-87	0.18 a	3.60 a	91
	LSD $P<0.05$	0.17	1.87	ns
0.8 - 1.0	Ghurka	0	0.02	
	Tinticurrin	0	0.00	
	Hartog	0	0.00	
	Harper	0	0.00	
	Bahatans-87	0.02	0.18	40
	LSD $P<0.05$	0.02	0.17	ns

Data with the same letter indicate no significant difference between cultivars ( $P<0.05$ ), ns= not significant.

Mineral composition of the tap water

Parameter	Units	LOR
<b>pH in water Method: AN101</b>		
pH	pH Units	0.1 7.5
<b>Conductivity and TDS by Calculation - Water Method: AN106</b>		
Conductivity @ 25 C	µS/cm	2 870
<b>Total Dissolved Solids (TDS) in water Method: AN113</b>		
Total Dissolved Solids Dried at 180°C	mg/L	10 430
<b>Alkalinity Method: AN135</b>		
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5 70
Hydroxide Alkalinity as OH <sup>-</sup>	mg/L	5 <5
Carbonate Alkalinity as CO <sub>3</sub> <sup>2-</sup>	mg/L	1 <1
Bicarbonate Alkalinity as HCO <sub>3</sub> <sup>-</sup>	mg/L	5 86
<b>Fluoride by Ion Selective Electrode in Water Method: AN141</b>		
Fluoride by ISE	mg/L	0.1 0.7
<b>Chloride by Discrete Analyser in Water Method: AN274</b>		
Chloride	mg/L	1 220
<b>Sulphate in water Method: AN275</b>		
Sulphate	mg/L	1 19
<b>Nitrate Nitrogen and Nitrite Nitrogen (NO<sub>x</sub>) by FIA Method: AN253</b>		
Nitrate, NO <sub>3</sub> as NO <sub>3</sub>	mg/L	0.05 <0.05
<b>Low Level Ammonia Nitrogen by FIA Method: AN261</b>		
Ammonia Nitrogen, NH <sub>3</sub> as N	mg/L	0.005 <0.005
<b>Metals in Water (Dissolved) by ICPOES Method: AN320/AN321</b>		
Aluminium, Al	mg/L	0.02 <0.02
Barium, Ba	mg/L	0.01 0.10
Calcium, Ca	mg/L	0.2 18
Iron, Fe	mg/L	0.02 <0.02
Lead, Pb	mg/L	0.005 <0.005
Magnesium, Mg	mg/L	0.1 6.2
Manganese, Mn	mg/L	0.005 <0.005
Potassium, K	mg/L	0.1 5.3
Silica, Soluble	mg/L	0.05 6.7
Silicon, Si	mg/L	0.02 3.1
Sodium, Na	mg/L	0.5 140
Strontium, Sr	mg/L	0.005 0.18