Supplementary Material 2

Supplementary Table S1: Range of input values for generating bean root phenotypes. PR – primary root; HBR- Hypocotyl-Borne-Root; BW – Basal Whorl; BW1, BW2, BW3, BW4, BW5 refer to the position of the basal whorl counted from basipetal to acropetal position; Dia – axial root diameter; Lat.Dia – lateral root diameter; LRBD – lateral root branching density.

	Units	Min	Max	References
Number.BW1	NA	0	4	Miguel et al., 2013
Number.BW2	NA	0	4	
Number.BW3	NA	0	4	
Number.BW4	NA	0	4	
Number.BW5	NA	0	4	
Number.HBR	NA	0	30	Miller et al., 2003
PR.Dia	cm	0.08	0.45	Henry et al., 2009
BW1.Dia	cm	0	0.45	
BW2.Dia	cm	0	0.45	
BW3.Dia	cm	0	0.45	
BW4.Dia	cm	0	0.45	
BW5.Dia	cm	0	0.45	
HBR.Dia	cm	0	0.45	
BW1.Lat.Dia	cm	0	0.03	
BW2.Lat.Dia	cm	0	0.03	
BW3.Lat.Dia	cm	0	0.03	
BW4.Lat.Dia	cm	0	0.03	
BW5.Lat.Dia	cm	0	0.03	
HBR.Lat.Dia	cm	0	0.03	
PR.Lat.Dia	cm	0	0.03	
BW1.LRBD	cm^{-1}	0	40	Miller et al., 2003
BW2.LRBD	cm^{-1}	0	40	
BW3.LRBD	cm^{-1}	0	40	
BW4.LRBD	cm^{-1}	0	40	
BW5.LRBD	cm^{-1}	0	40	
PR.LRBD	cm^{-1}	0	40	
HBR.LRBD	cm^{-1}	0	40	
BW1.Angle	degree	0	90	Miguel et al., 2013
BW2.Angle	degree	0	90	
BW3.Angle	degree	0	90	
BW4.Angle	degree	0	90	
BW5.Angle	degree	0	90	

Supplementary Table S2: Range of input values for generating maize root phenotypes. PR - Primary Root; SR -Seminal Root; NR-Nodal Root; NR1, NR2, NR3, NR4 refer to the nodal root position; Dia – axial root diameter; Lat.Dia – lateral root diameter; LRBD – lateral root branching density. *NR at different positions were considered to have similar parameters.

	Units	Min	Max	References
Number.SR	NA	0	12	Hochholdinger and Tuberosa, 2009
Number.NR1	NA	0	12	Burton et al., 2013; York and Lynch, 2015
Number.NR2	NA	0	12	
Number.NR3	NA	0	12	
Number.NR4	NA	0	12	
PR.Dia	cm	0.08	0.6	Burton et al., 2013; Burton et al., 2014; York and Lynch, 2015
SR.Dia	cm	0	0.6	
NR1.Dia	cm	0	0.6	
NR2.Dia	cm	0	0.6	
NR3.Dia	cm	0	0.6	
NR4.Dia	cm	0	0.6	
PR.Lat.Dia	cm	0	0.05	
SR.Lat.Dia	cm	0	0.05	
NR1.Lat.Dia	cm	0	0.05	
NR2.Lat.Dia	cm	0	0.05	
NR3.Lat.Dia	cm	0	0.05	
NR4.Lat.Dia	cm	0	0.05	
PR.LRBD	cm^{-1}	0	40	Postma et al., 2014; York and Lynch, 2015
SR.LRBD	cm^{-1}	0	40	
NR1.LRBD	cm^{-1}	0	40	
NR2.LRBD	cm^{-1}	0	40	
NR3.LRBD	cm^{-1}	0	40	
NR4.LRBD	cm^{-1}	0	40	
SR.Angle	degree	0	90	Liao et al., 2004; Zhu et al., 2005
NR1.Angle	degree	0	90	
NR2.Angle	degree	0	90	
NR3.Angle	degree	0	90	
NR4.Angle	degree	0	90	

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