

Table S1 Conversions of root point data from 3D laser scanner to scale based on the relationships in the coordinates or diameter of roots between manual measurement data (x_m, y_m, z_m, d_m) and 3D laser scanner measurement data ($x_{3D}, y_{3D}, z_{3D}, d_{3D}$).

	Root system 1	Root system 2
x -coordinate	$x_{1m} = -5.111 x_{13D} + 1328.6$	$x_{2m} = -8.020 x_{23D} + 2066.9$
y -coordinate	$y_{1m} = -5.043 y_{13D} + 1293.8$	$y_{2m} = -6.054 y_{23D} + 2227.2$
z -coordinate	$z_{1m} = 5.219 z_{13D} - 99.6$	$z_{2m} = 9.920 z_{23D} - 211.32$
Diameter	$d_{1m} = 4.889 d_{13D} - 5.12$	$d_{2m} = 6.465 d_{23D} - 12.22$



Figure S1. How we measured the root system by hand against a 100 mm \times 100 mm grid. This photo shows *Cryptomeria japonica*.

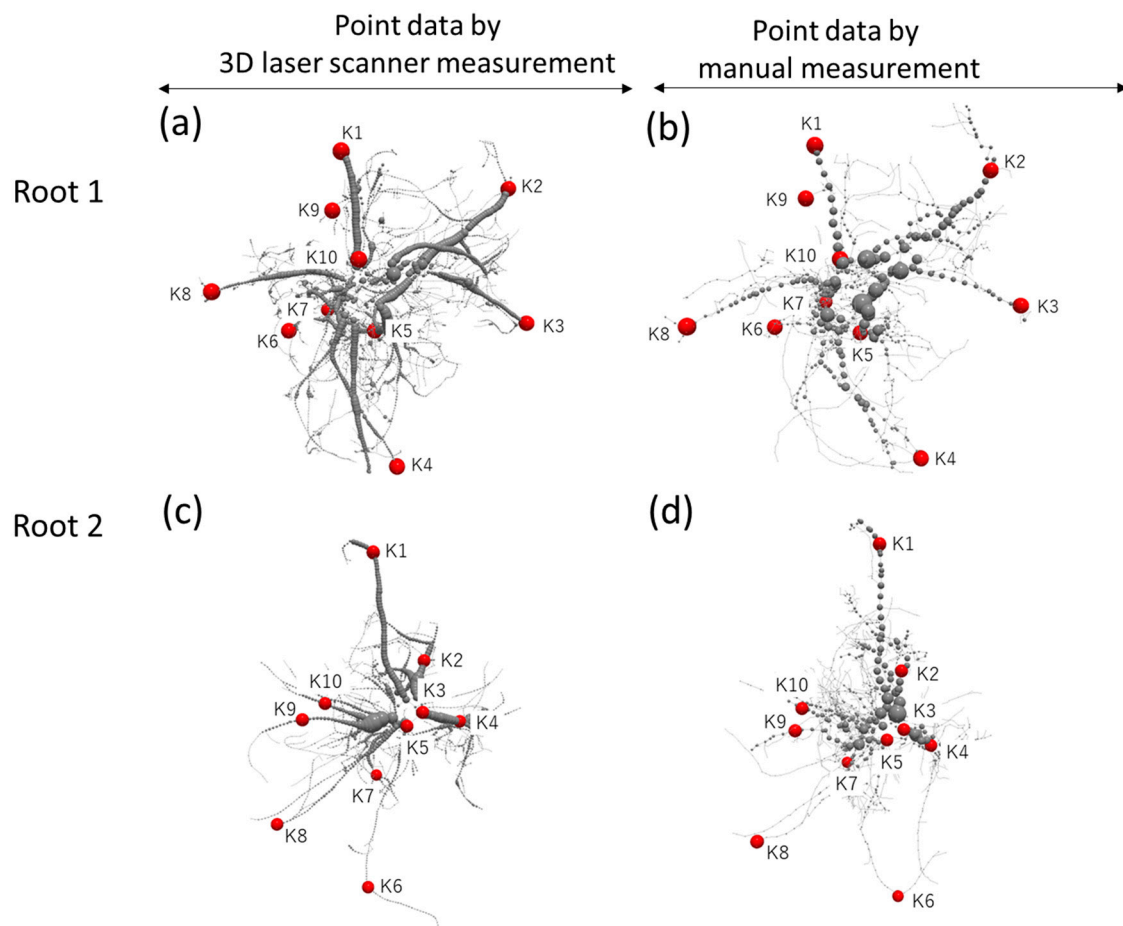


Figure S2. Positions of 10 points (K1–K10) set to relate locations of roots to actual scale.

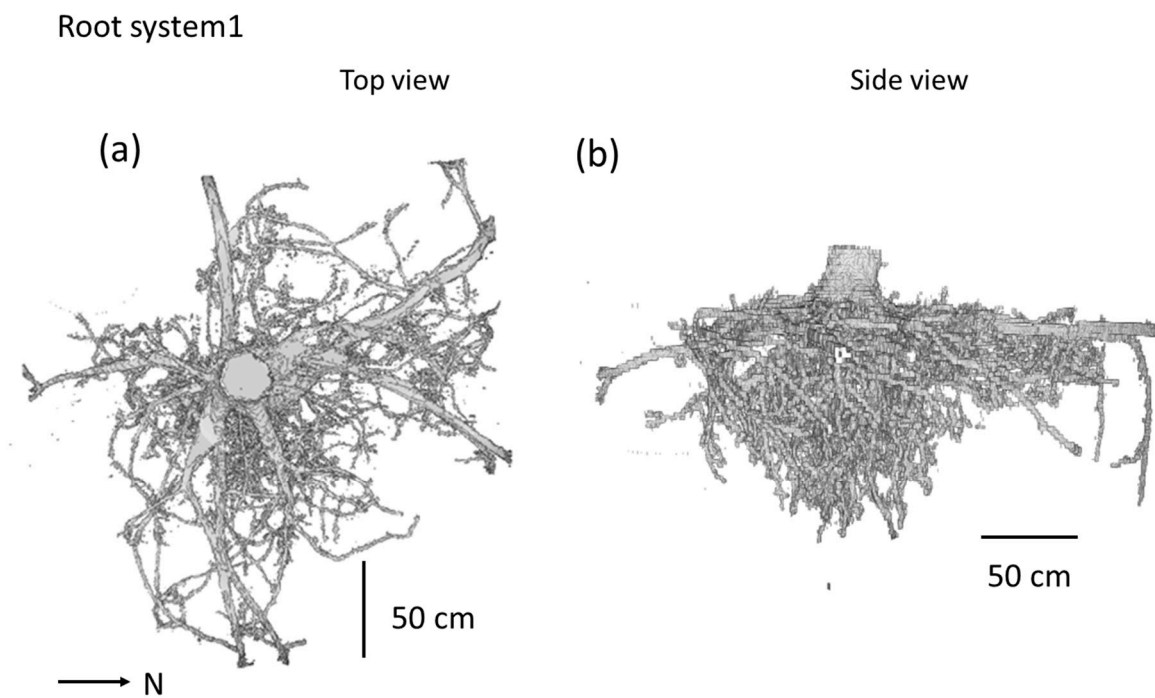


Figure S3. (a) Top and (b) side views of root system 1 drawn from point cloud data collected by 3D laser scanner. These are the same as Fig. 3 (A, a) but enlarged.

Root system 2

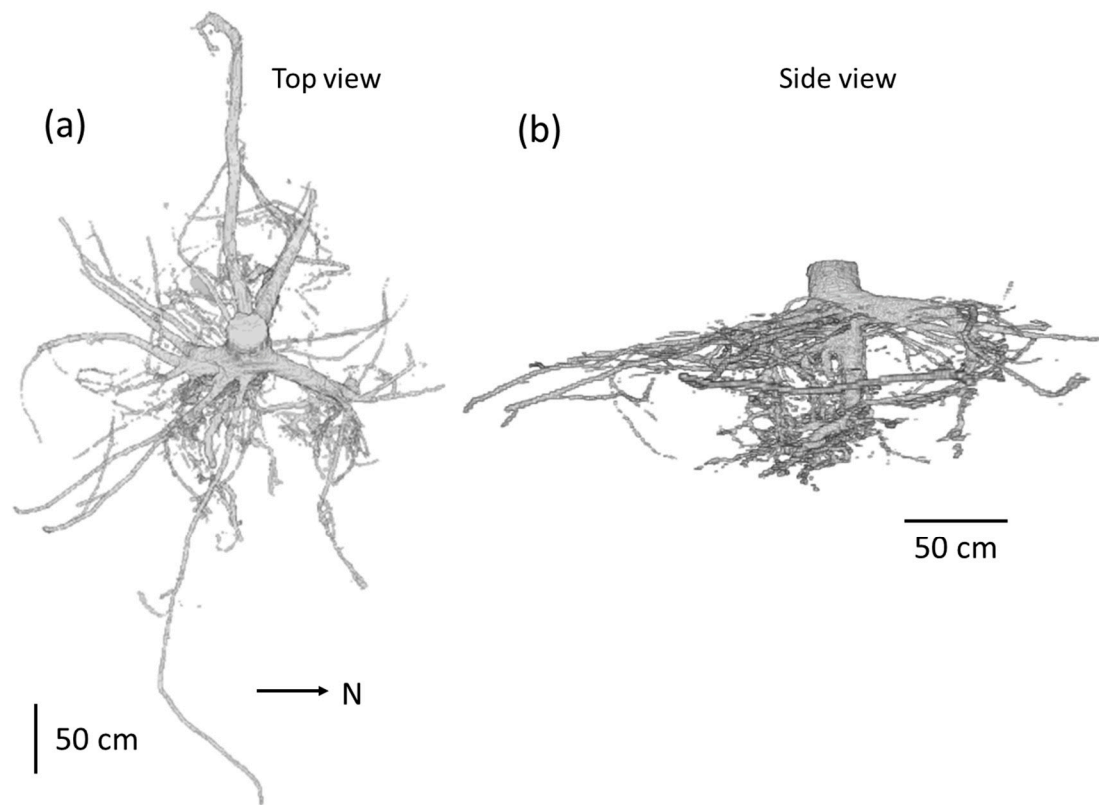


Figure S4. (a) Top and (b) side views of Root system 2 drawn from point cloud data collected by 3D laser scanner. These are the same as Fig. 4 (A, a) but enlarged.