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Supplementary Material: *Functional Plant Biology*

Supplementary Material

Phenotyping roots in darkness: disturbance-free root imaging with near infrared illumination

Rongli Shi[A], *Astrid Junker*[A], *Christiane Seiler*[A] *and Thomas Altmann*[A,B]

[A]Department of Molecular Genetics, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) Gatersleben, Stadt Seeland, Germany.

[B]Corresponding author. Email: altmann@ipk-gatersleben.de

Fig. S1. The lateral light was produced by a halogen lamp in short-term light exposure experiment.

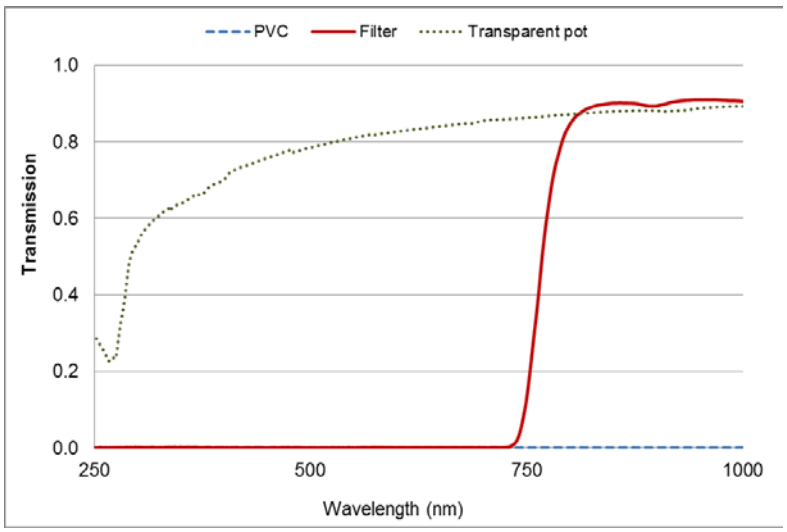
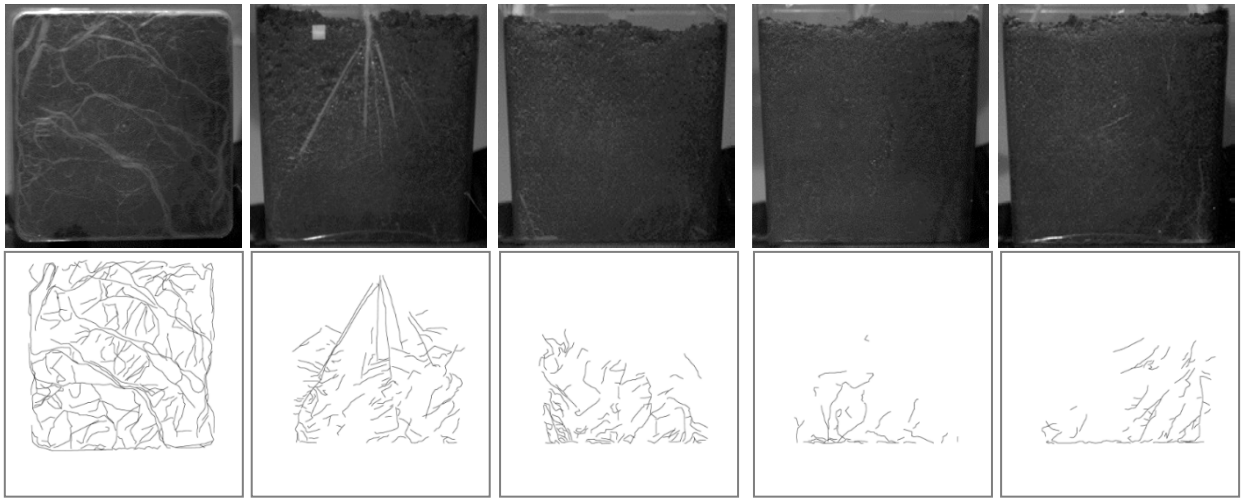


Fig. S2. Transmission of different materials: PVC plate (blue dot line), NIR-pass filter (red solid line) and the transparent pot (green dot line).

(A)



(B)

Fig. S3. Root image analysis. After three weeks of culture with long-term light exposure, five NIR images were taken from each transparent pot (bottom, side1 where the seeds were sowed, side2, side3 and side4). Root NIR images (A) were analyzed by SmartRoot (referred to as 'visible roots'). Roots were washed and scanned afterwards. Scanned roots (B) were analyzed by WinRhizo Pro (referred to as 'total roots').

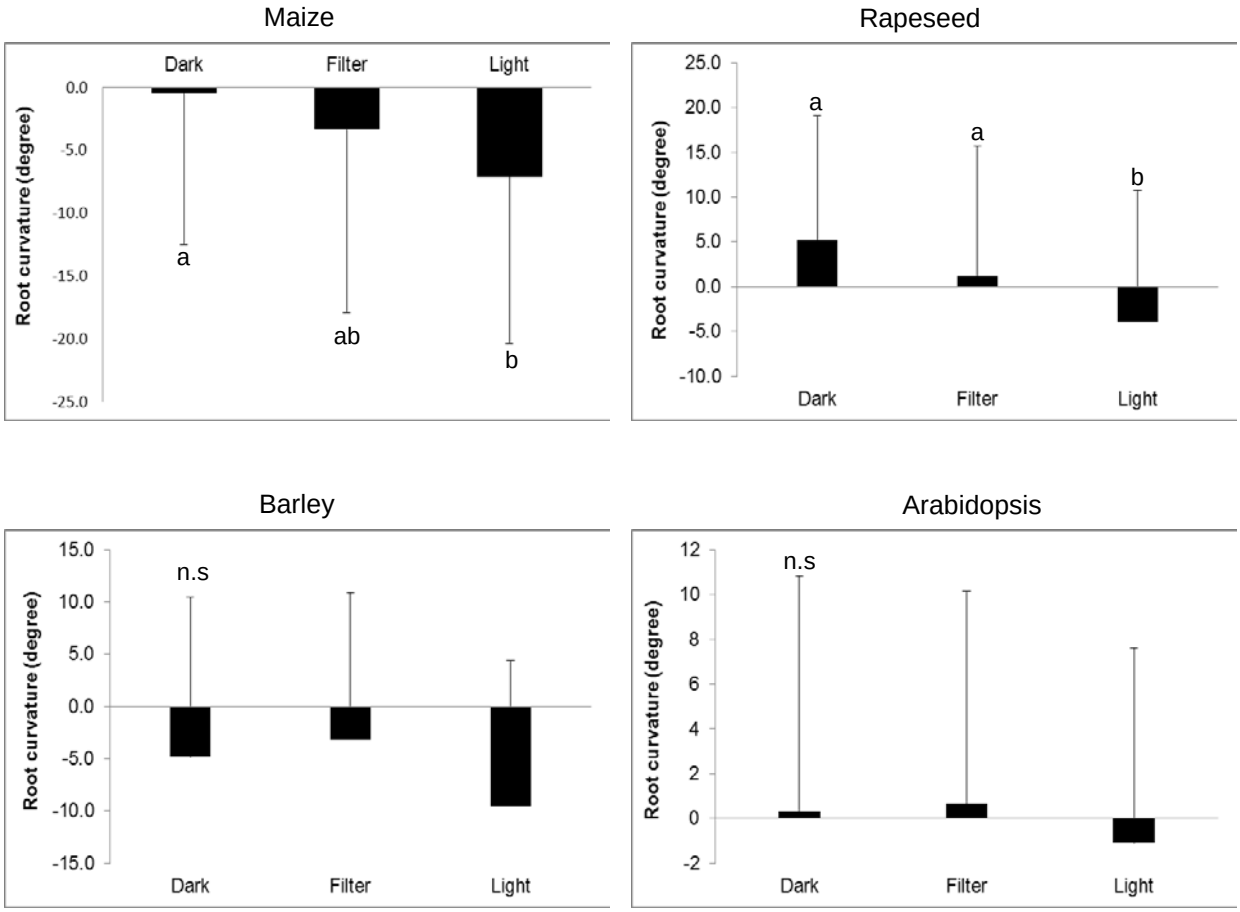


Fig. S4. Root orientation of maize (n=134), rapeseed (n=198), barley (n=76) and Arabidopsis (n=160) in short term light response experiment. The angle was calculated based on the differences of primary root (the longest root for barley) before and after unilateral light treatment by software image J. Different letters indicate significant differences between treatments by ANOVA contrast test ($p<0.05$) (n.s denotes no significant difference).

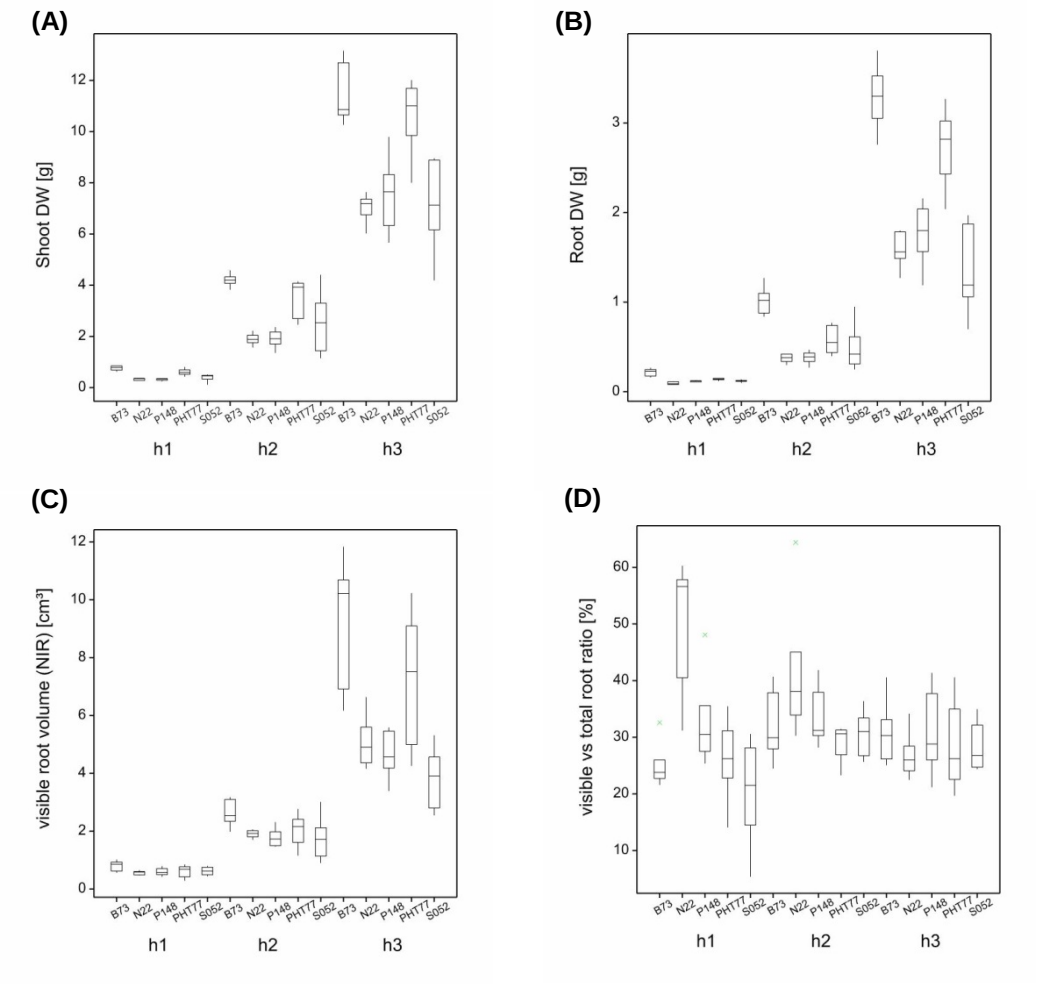


Fig. S5. Developmental time course of root and shoot growth of five maize genotypes (B73, N22, P148, PHT77, S052). h1, h2, h3: harvest 2, 3, 4 weeks after sowing, respectively. (A) Shoot dry weight. (B) Root dry weight. (C) NIR imaging derived visible root volume. (D) Ratio of visible versus total (scanning-derived) root volume. Plants were cultivated in transparent pots with substrate.