Supplemental Information

Figure S1: The Plant Spinner is composed of an aluminum framed box, a top-mounted clamp, and rotary component. Plants were placed in the Plant Spinner and images of roots and shoots were acquired at 1-degree intervals.

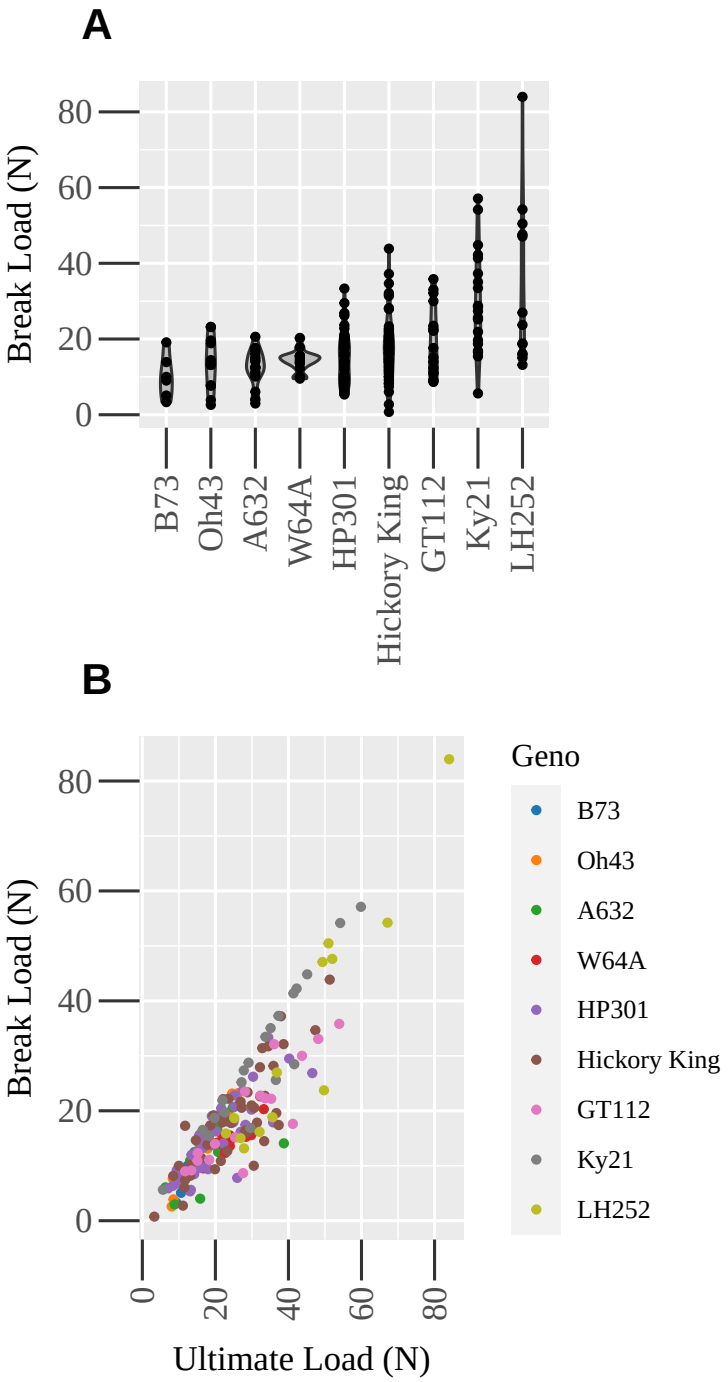

Figure S2: Brace root biomechanics were measured by 3-point bend testing for 9 inbred genotypes. The (A) break load and (B) structural stiffness are variable by genotype.

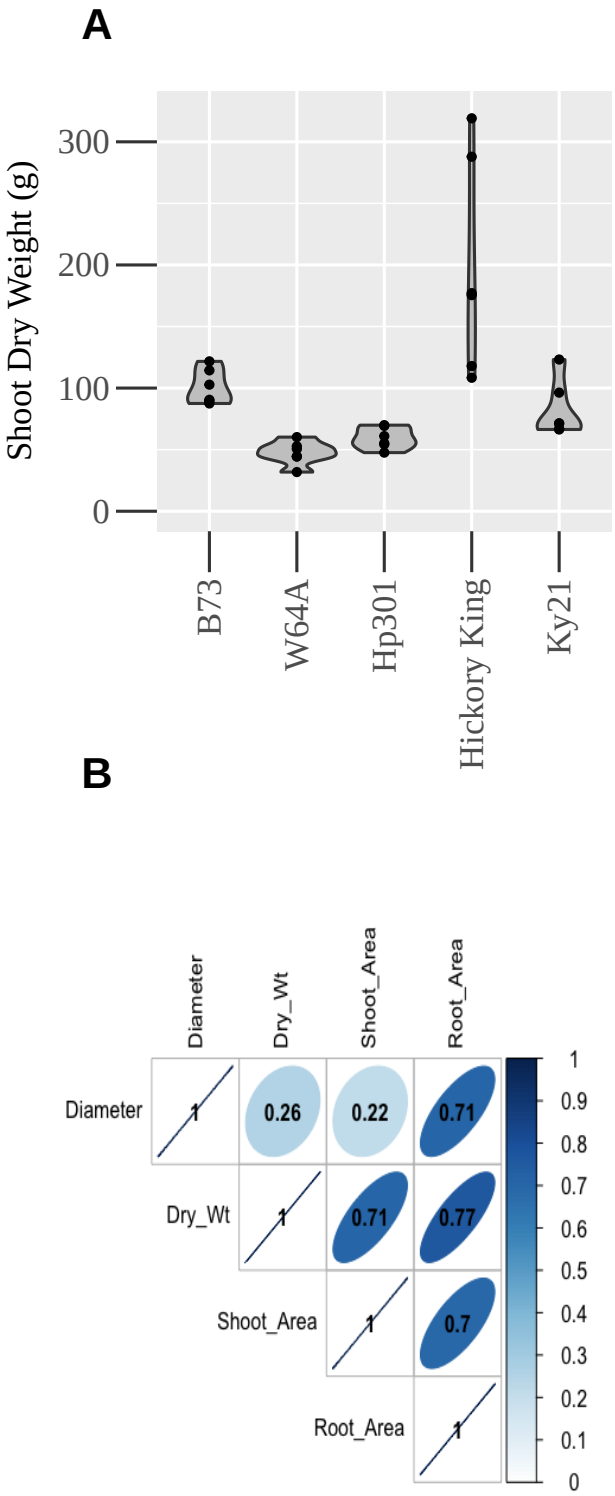

Figure S3: Shoot dry weights were collected from the plants analyzed for nitrogen uptake. Hickory King dry weight was significantly higher than the other genotypes by ANOVA and Tukey HSD p-value <0.01

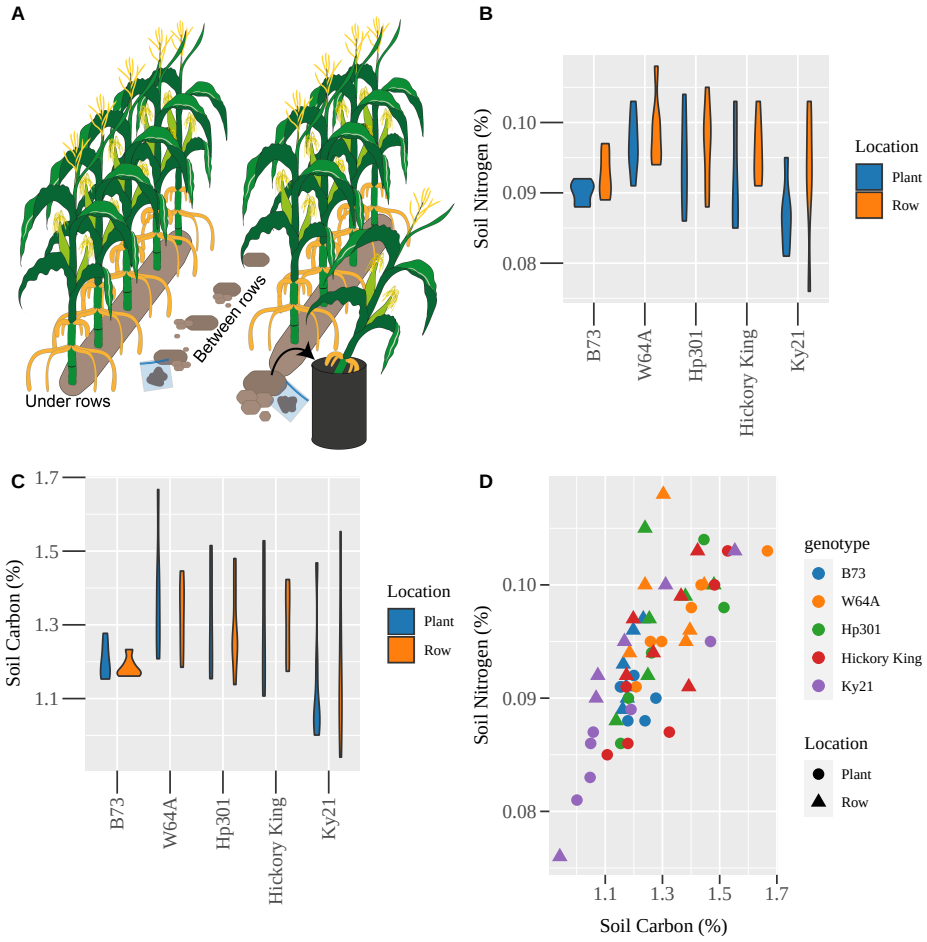

Figure S4: Soil carbon and nitrogen levels. (A) There was no difference in soil nitrogen (ANOVA p=0.922) or (B) soil carbon (ANOVA p=0.928) between collection from below plants (blue) and between rows (orange) within a genotype. (C) Illustration of sample collection. (D) A high positive correlation (r=0.76) between percent nitrogen and percent carbon suggests that nutrients are present as organic matter rather than residual inorganic fertiliser.

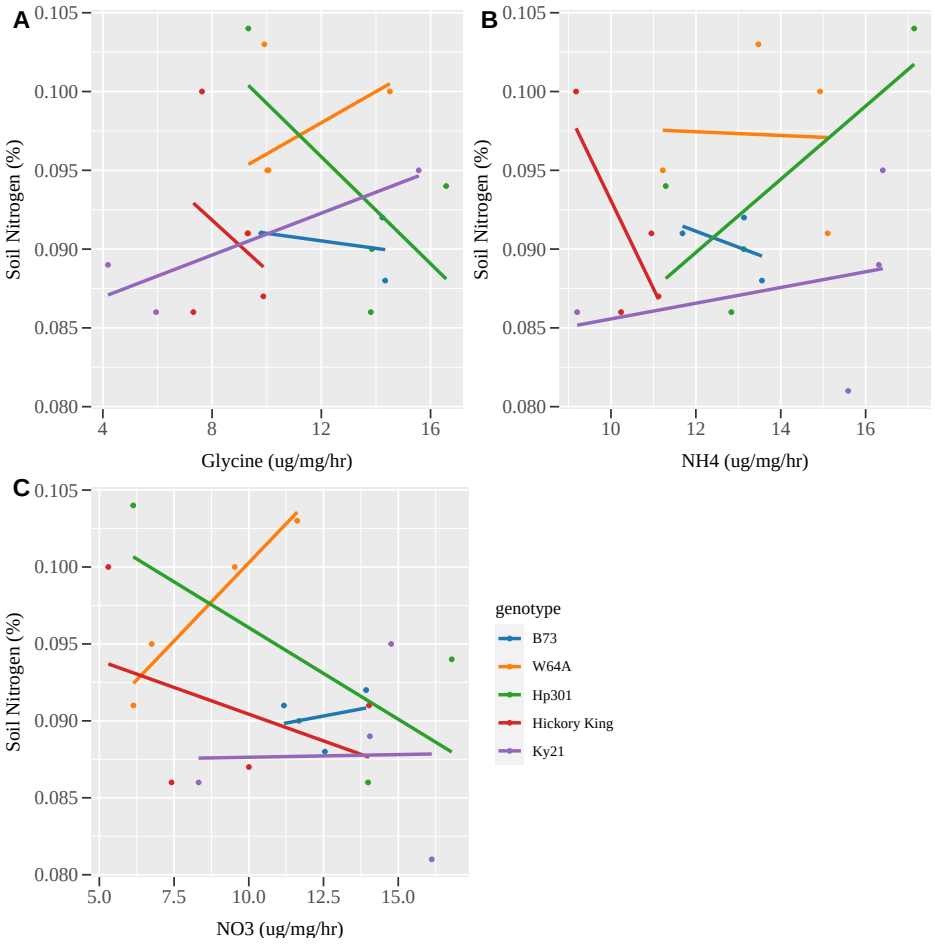

Figure S5: Soil nitrogen by uptake. There is no correlation between soil nitrogen levels and root nitrogen uptake across the 5 lines measured.