

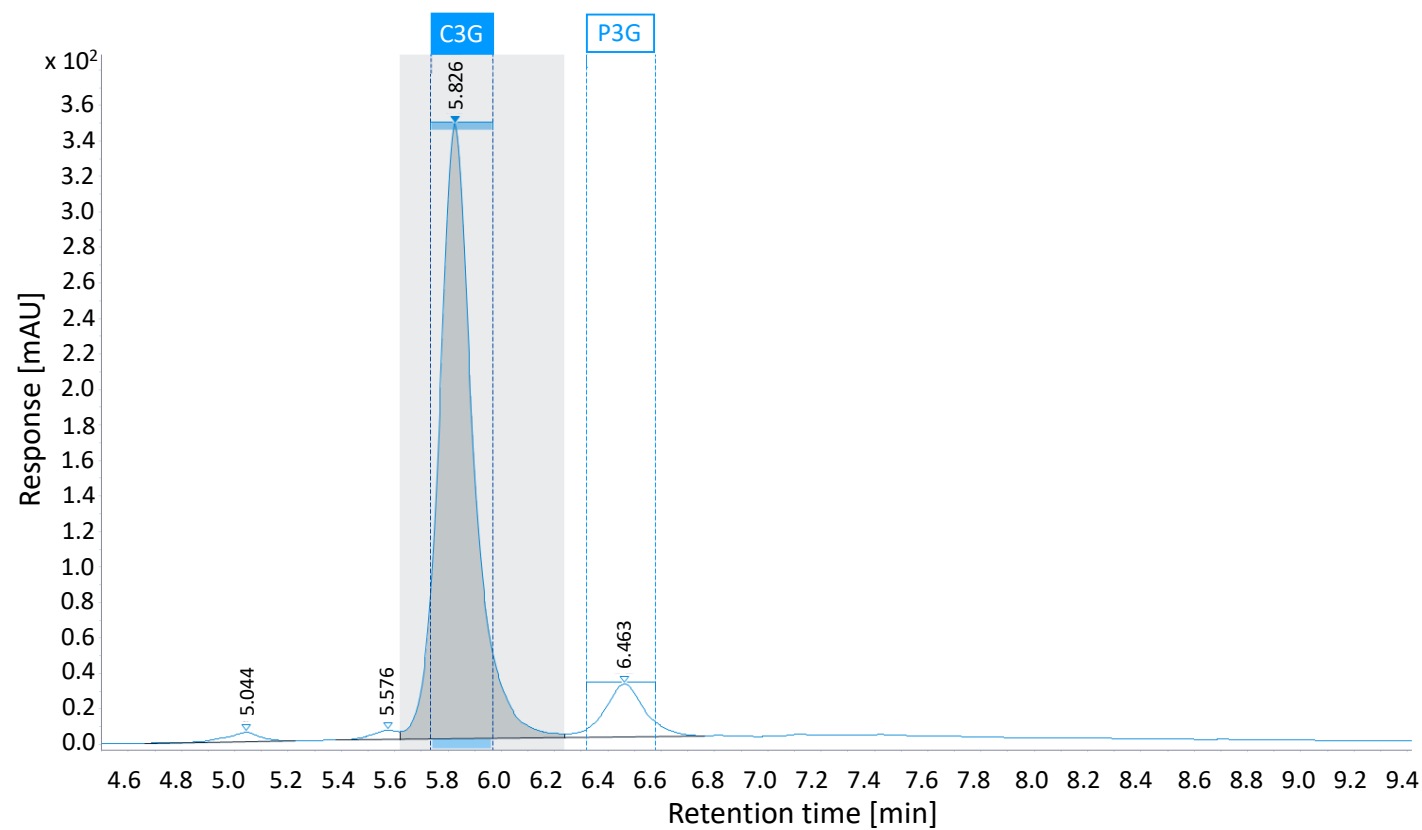


Figure S1: Demonstration of chromatogram of C3G and P3G peaks by HPLC in one biological replicate of genotype SCU23.

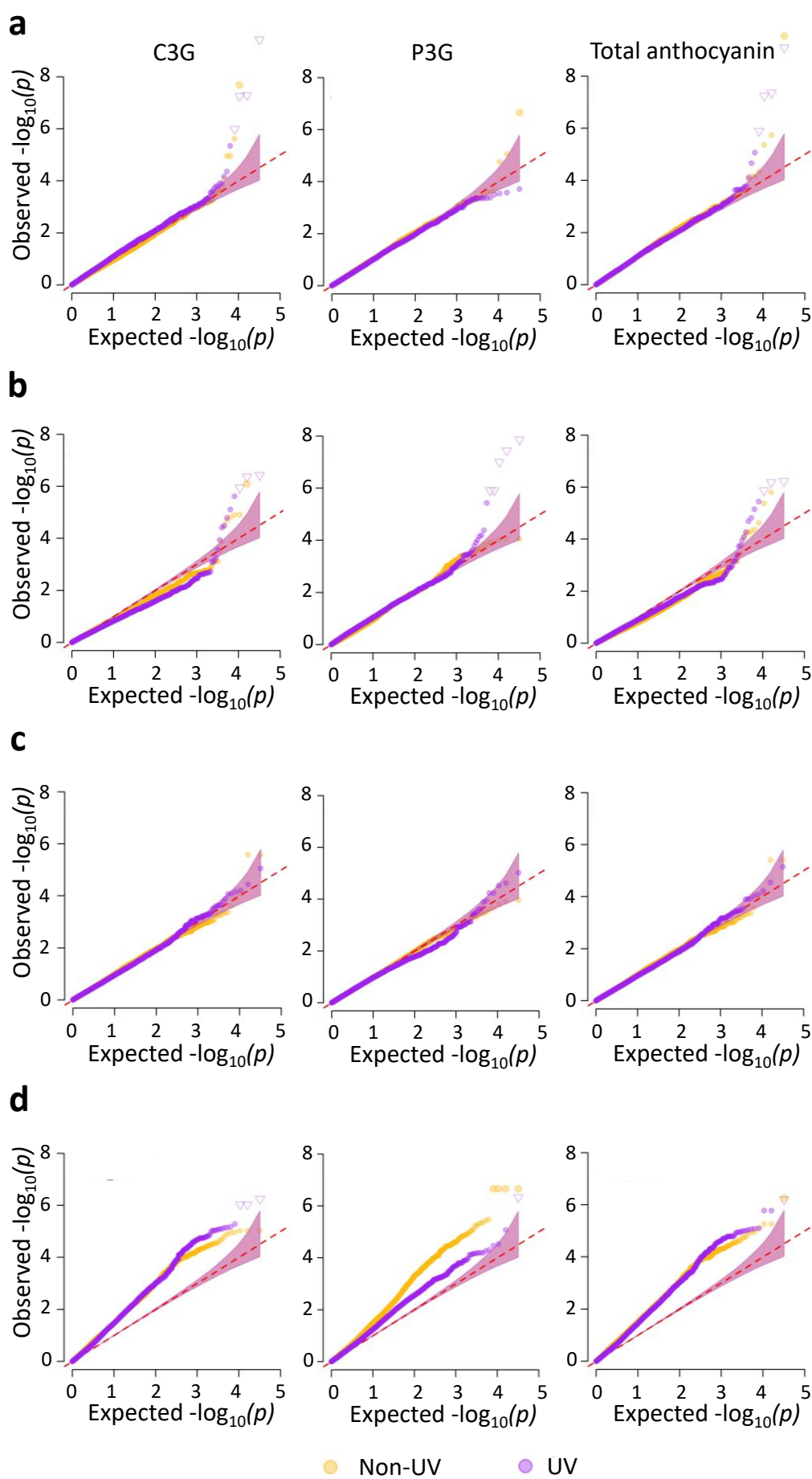


Figure S2: Quantile-quantile plots for the GWAS of anthocyanins under non-UV condition (yellow dots) and UV conditions (purple dots) using GAPIT models: a, BLINK; b, FarmCPU; c, MMLM; and d, SUPER.

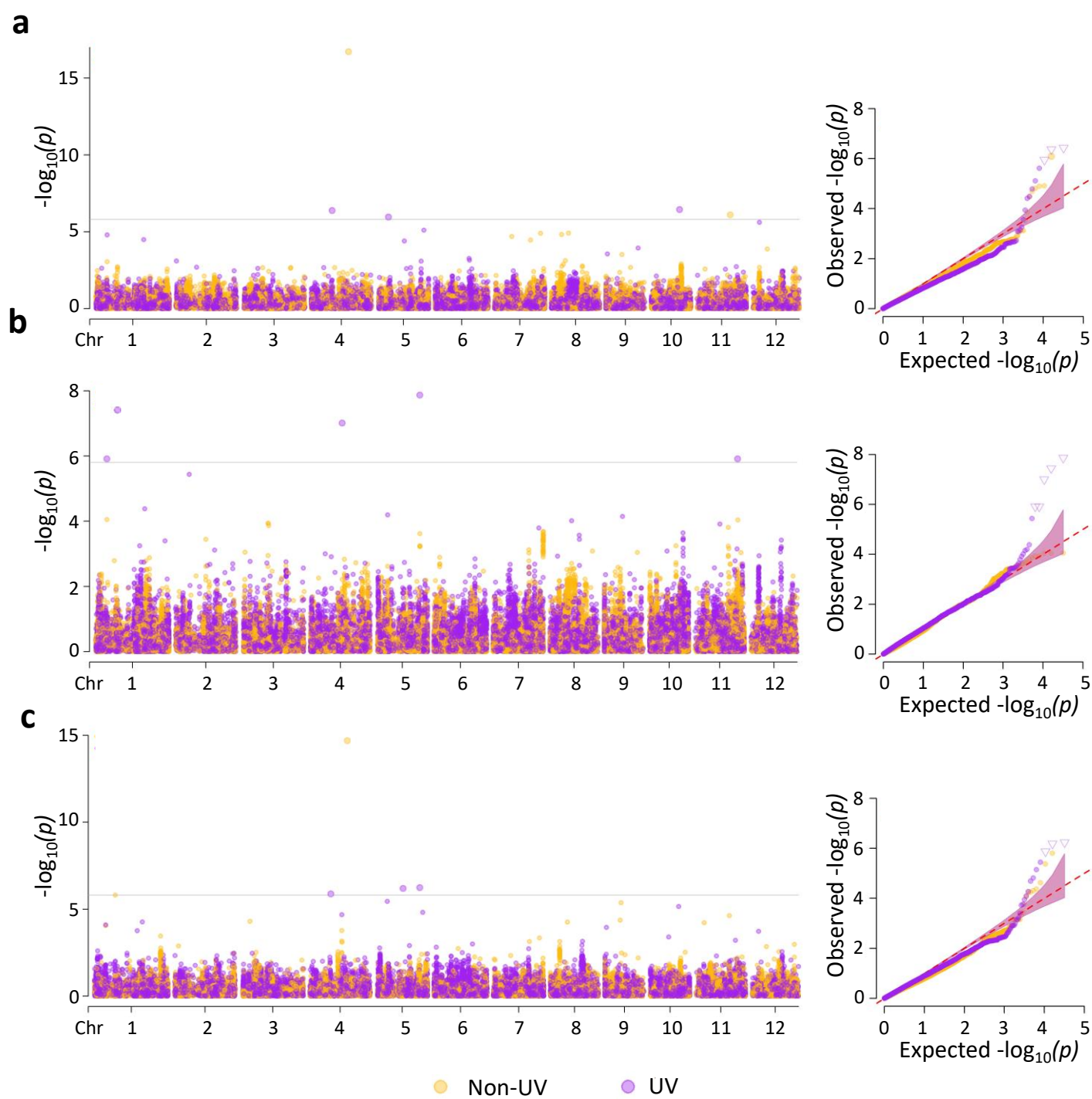


Figure S3: Manhattan and q-q plots for the GWAS of FarmCPU under non-UV condition (yellow dots) and UV conditions (purple dots): a, C3G; b, P3G; c, total anthocyanin

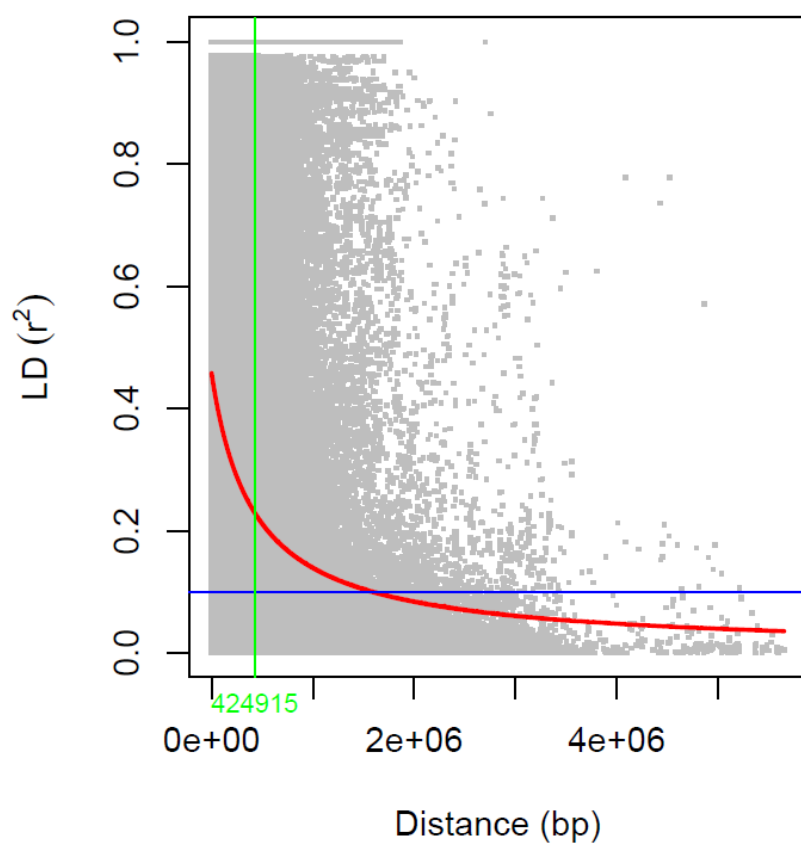


Figure S4: Linkage Disequilibrium graph. Blue line is the significance threshold at $r^2= 0.1$ while green line indicates when LD coefficient r^2 reached half of its maximum values. Red line is the trend line as distance increases LD decreases.

UV conditions
184 – 200 $\mu\text{W}/\text{cm}^2$

Non-UV conditions
0 – 35 $\mu\text{W}/\text{cm}^2$



Figure S5: Field experiment set up from the bird's eye view, with the non-UV conditions on the right side and UV conditions on the left side. UV-B radiation ($\mu\text{W}/\text{cm}^2$) were measured on each plot, both under the shade structure and in the UV-exposed conditions.