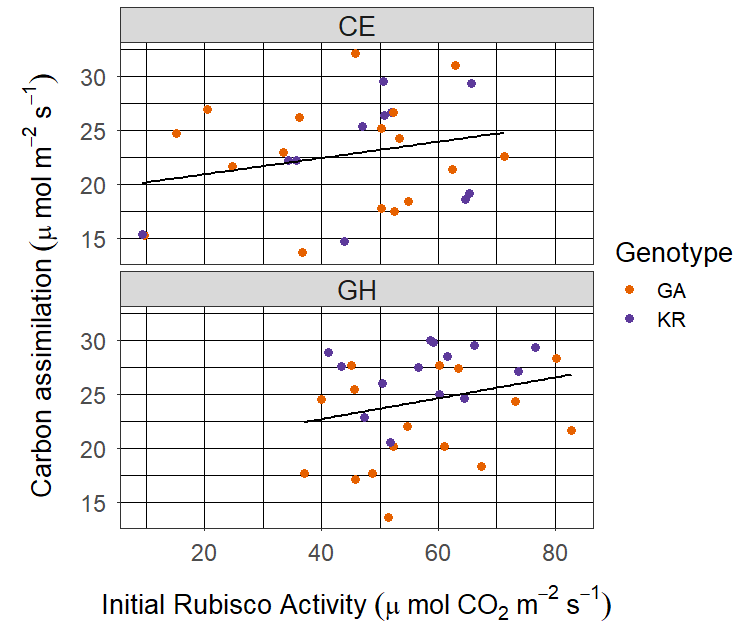
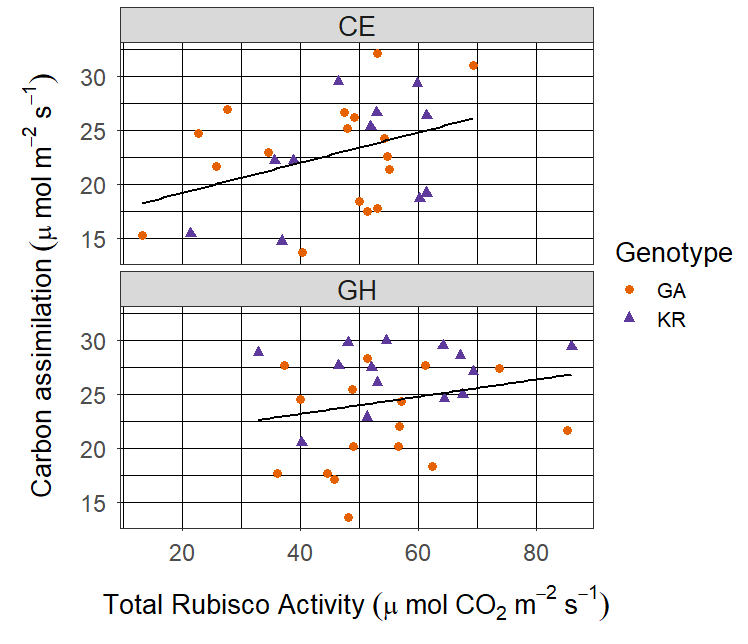
**Table S1.** Maximum, minimum, and average values of temperature and vapor pressure deficit (VPD) across the entirety of both experiments (CE, Controlled environment; GH, glasshouse) for both genotypes Krichauff (KR) and Gatsby (GA).

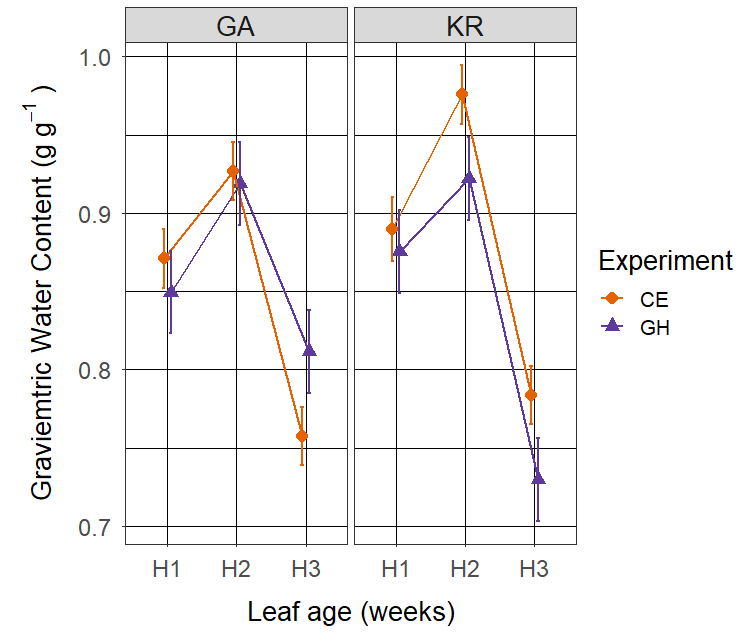
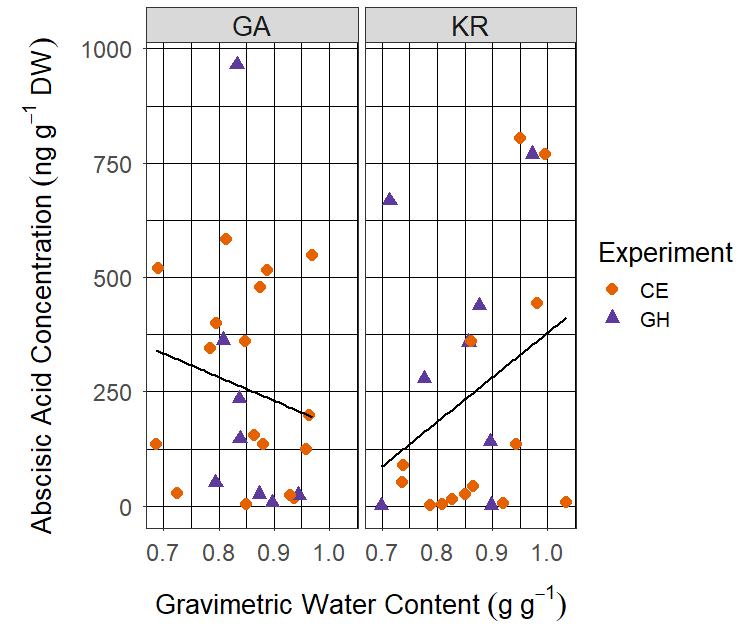
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exp | Maximum Temperature | Minimum Temperature | Average Temperature | Maximum VPD | Minimum VPD | Average VPD |
| CE | 24.2 | 18.8 | 22.2 | 1.9 | 0.83 | 1.15 |
| GH | 27.4 | 19.1 | 22.7 | 2.4 | 0.53 | 1.44 |

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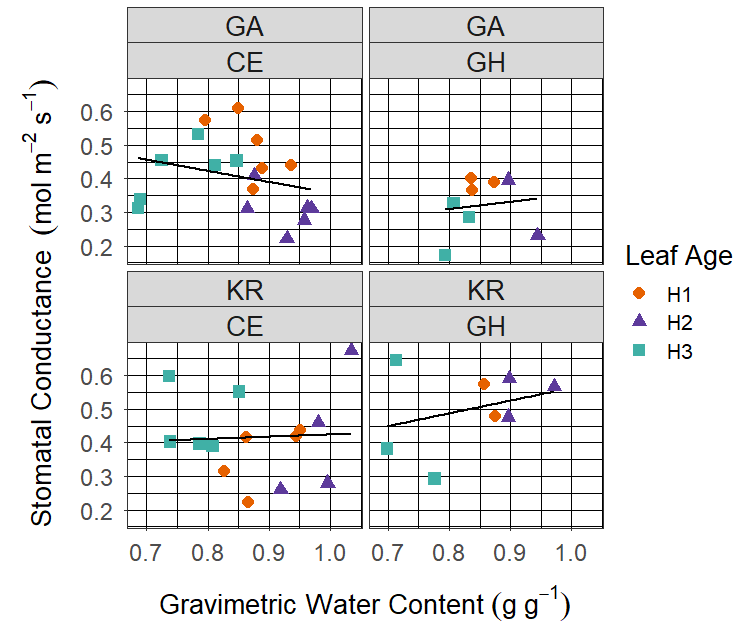
**Figure S1.** The impact of Rubisco initial activity on CO2 assimilation in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Samples were taken from young expanding (H1- 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) leaves after gas exchange measurements were completed under growth conditions. Data points represent a single biological replicate.



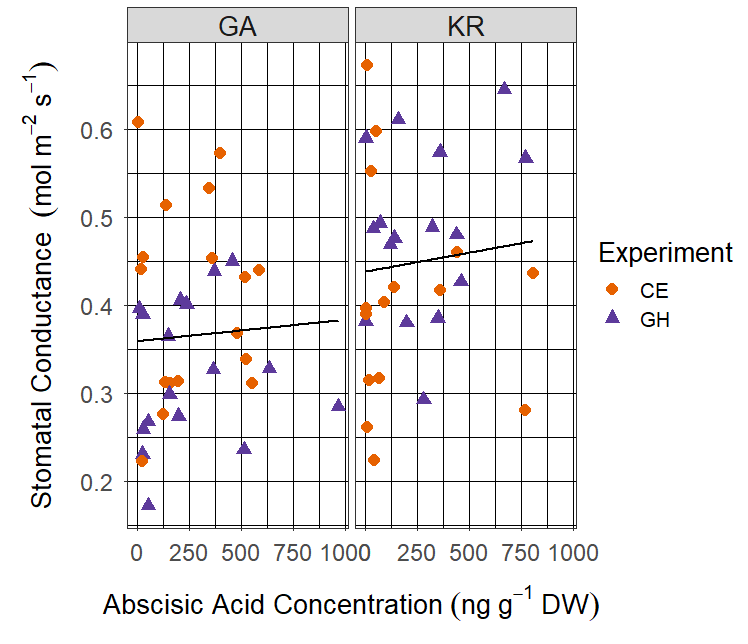
**Figure S2.** The impact of Rubisco total activity on CO2 assimilation in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Samples were taken from young expanding (H1- 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) leaves after gas exchange measurements were completed under growth conditions. Data points represent a single biological replicate.

**Figure S3.** The change in gravimetric water content between measurement dates in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Measurements of pot weight were taken when the fourth leaf was at young expanding (H1- 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) stages after gas exchange measurements were completed under growth conditions. Data points represent a the mean of 6 biological replicates +/- the standard error.

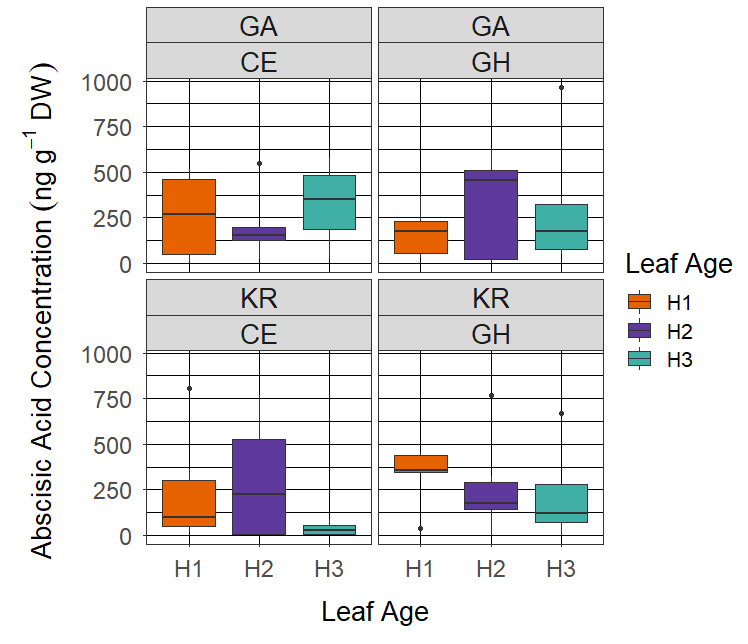
**Figure S4.** The impact of gravimetric water content on abscisic acid concentration in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Samples were taken from young expanding (H1- 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) leaves after gas exchange measurements were completed under growth conditions. Data points represent a single biological replicate.



**Figure S5.** The impact of gravimetric water content on stomatal conductance in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Gas exchange was measured at 400 μmol mol-1 CO2, PPFD = 1800 μmol m-2 s-1, and 26°C (block temp), in young expanding (H1 – 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) leaves. Data points represent a single biological replicate.



**Figure S6.** The impact of abscisic acid concentration on stomatal conductance in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Samples were taken from young expanding (H1- 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) leaves after gas exchange measurements were completed under growth conditions. Data points represent a single biological replicate.



**Figure S7.** The impact of leaf age on abscisic acid concentration in two wheat cultivars (KR, Krichauff; GA, Gatsby) grown in the glasshouse (GH) or controlled environment (CE) room. Samples were taken from young expanding (H1- 21 DAS), fully expanded (H2 – 28 DAS) and mature (H3 – 35 DAS) leaves after gas exchange measurements were completed under growth conditions. Data points represent a single biological replicate.