Fast chlorophyll *a* fluorescence induction (OJIP) phenotyping of chlorophyll-deficient wheat suggests that an enlarged acceptor pool size of Photosystem I helps compensate for a deregulated photosynthetic electron flow

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SUPPLEMENTARY MATERIAL

Supplementary Figure 1. Fast chlorophyll *a* fluorescence transients in bread wheat NS67 and mutants at the 4th week of analysis.

Supplementary Figure 2. Fast chlorophyll *a* fluorescence transients in durum wheat LD222 and mutants at the 4th week of analysis.

Supplementary Figure 3. Time-course variation of the apparent PSII antenna size (ABS/RC).

Supplementary Figure 4. Variation of apparent PSII antenna size (ABS/RC) over 4 weeks of analysis.

Supplementary Figure 5. Time-course variation of the maximum quantum yield of PSII photochemistry F_V/F_M.

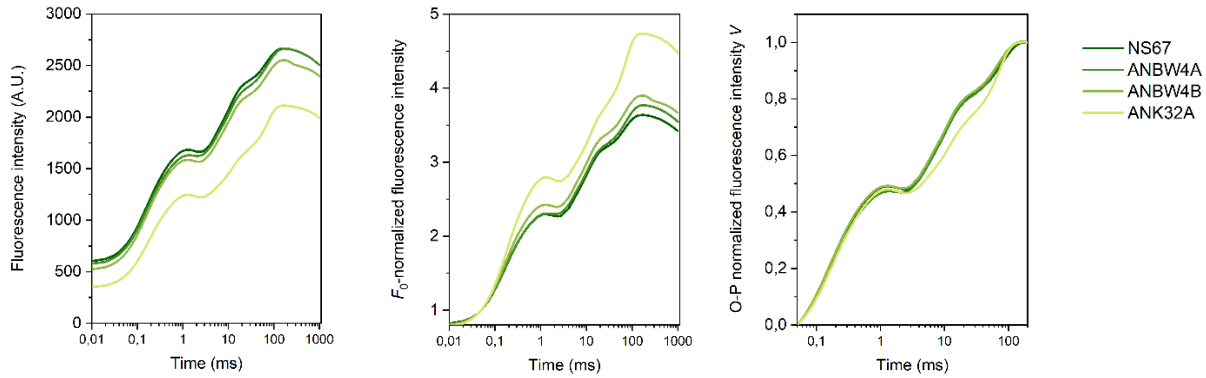
Supplementary Figure 6. Time-course variation of ΔV_{JP}.

Supplementary Figure 7. Time-course variation of ΔV_{IP}.

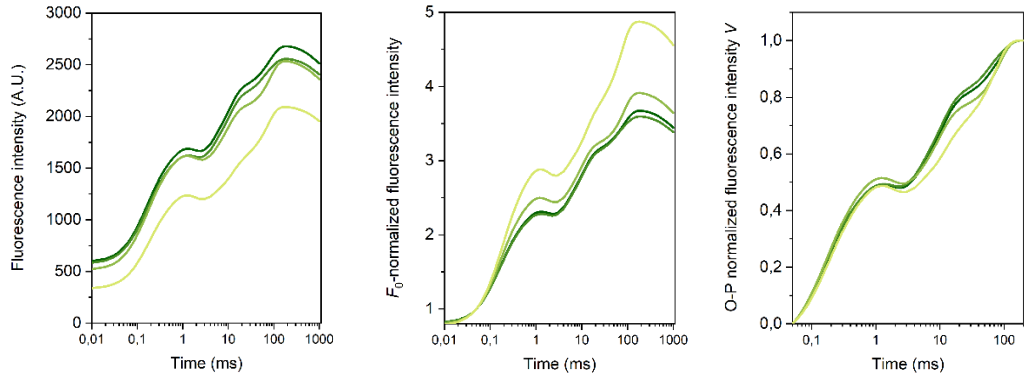
Supplementary Figure 8. Time-course variation of the fraction of lost PSII quantum yield (F_V/F_M) during a saturating double hit.

Supplementary Figure 1

Continuous light



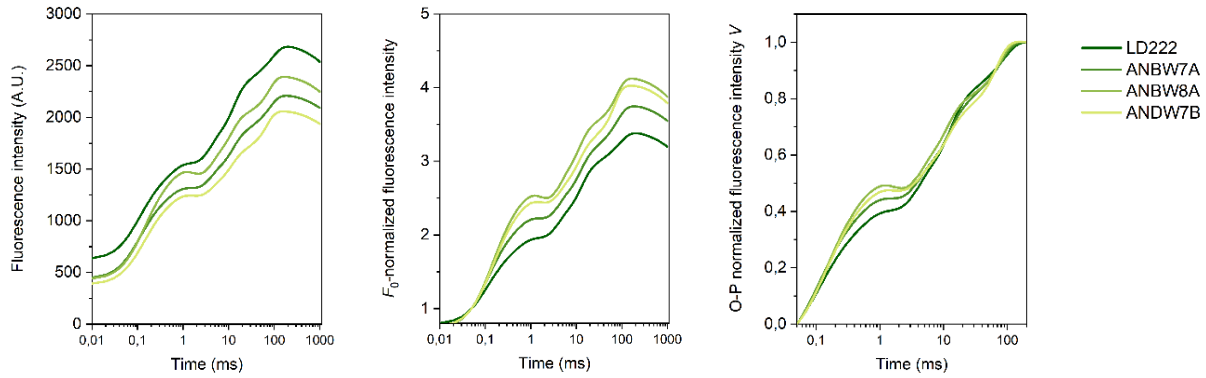
Fluctuating light



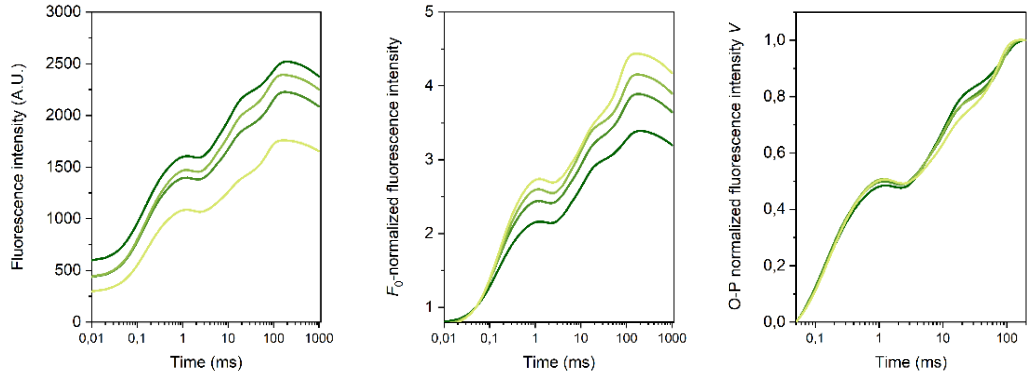
Fast chlorophyll *a* fluorescence transients recorded from wild-type bread wheat NS67 and the chlorophyll-deficient mutants ANBW4A, ANBW4B and ANK32A grown under a continuous or fluctuating light regime. The traces are built using the mean values of 8-14 determinations recorded at the 4th week of analysis.

Supplementary Figure 2

Continuous light

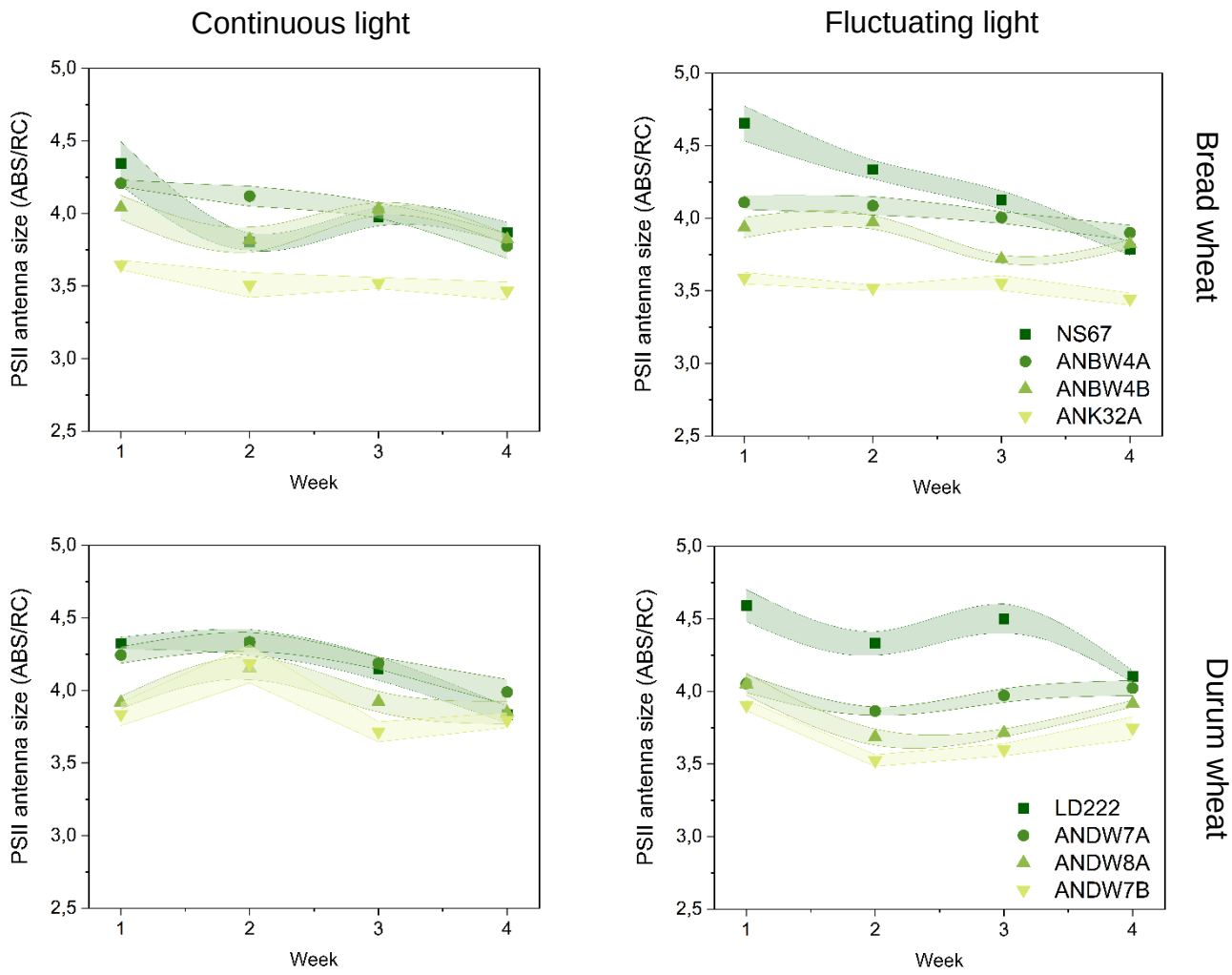


Fluctuating light



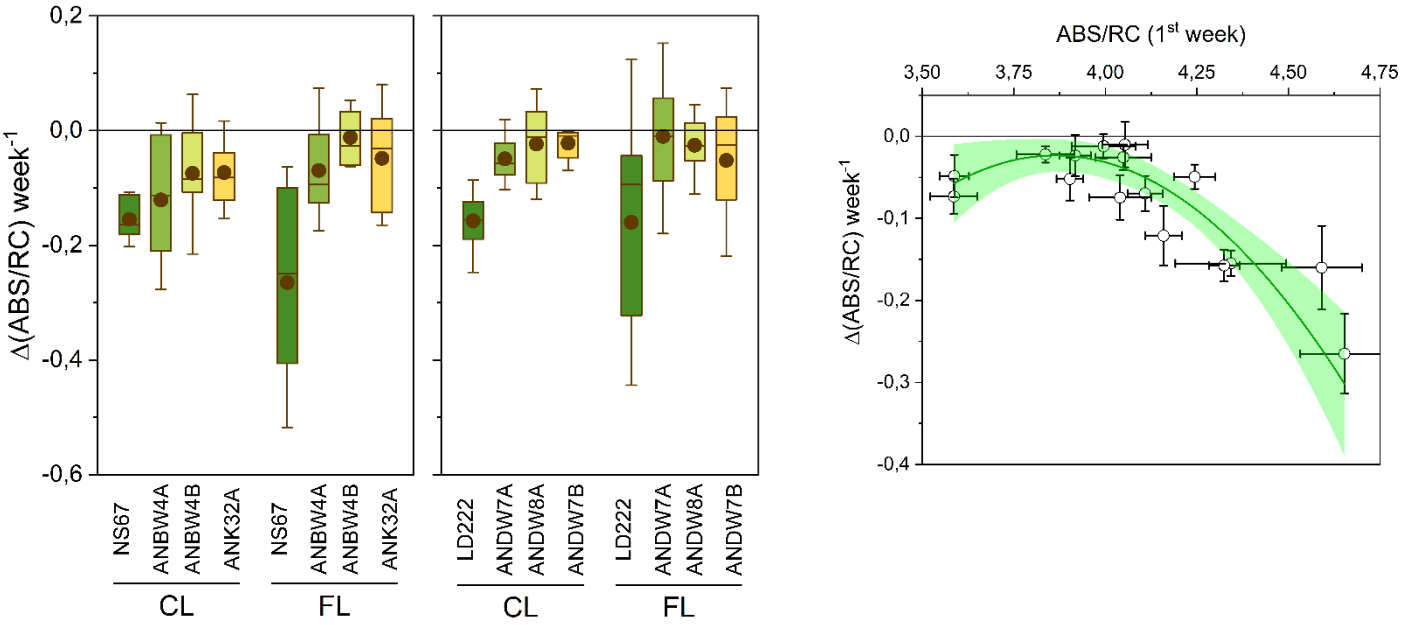
Fast chlorophyll *a* fluorescence transients recorded from wild-type durum wheat LD222 and the chlorophyll-deficient mutants ANDW7A, ANDW8A and ANDW7B grown under a continuous or fluctuating light regime. The traces using built with the mean values of 8-14 determinations recorded at the 4th week of analysis.

Supplementary Figure 3



Time-course variation of the apparent PSII antenna size (ABS/RC) in wild-type wheat (NS67, LD222) or chlorophyll-deficient mutants grown under a continuous or fluctuating light regime. Values are means ± SE (represented as a coloured band) of 8-14 determinations.

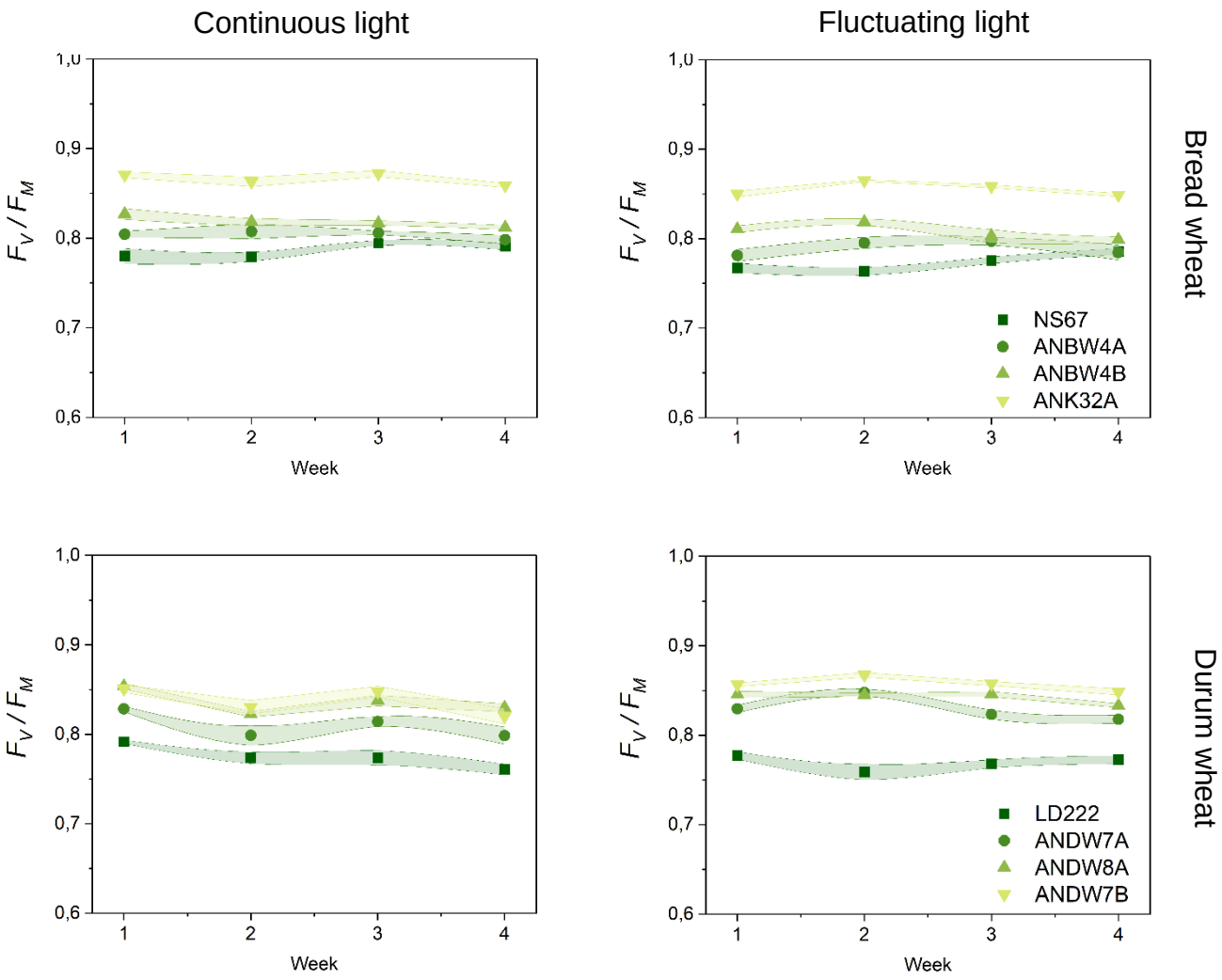
Supplementary Figure 4



On the left, variation rate of PSII antenna size ABS/RC over 4 weeks of analysis in wild-type wheat (NS67, LD222) or chlorophyll-deficient mutants grown under a continuous or fluctuating light regime. The box size is determined by the 25th and 75th percentiles, with whiskers at the 5th and 95th percentiles. The circle inside the box is the mean, the segment is the median.

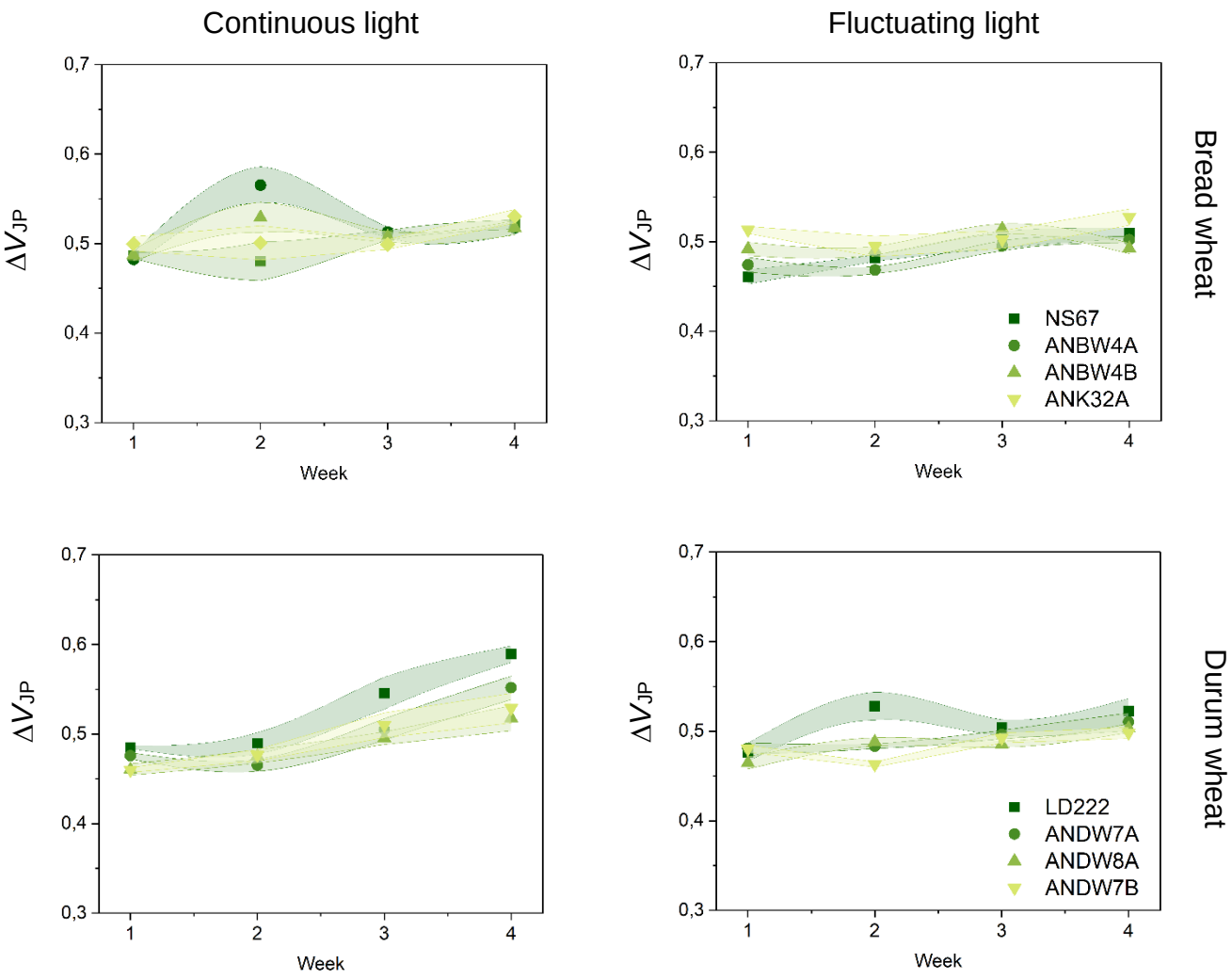
On the right, covariation of the ABS/RC variation rate and the ABS/RC value at the first week; the best fit was obtained with a 2nd order polynomial function, shown as a green line with 95% confidence bands.

Supplementary Figure 5



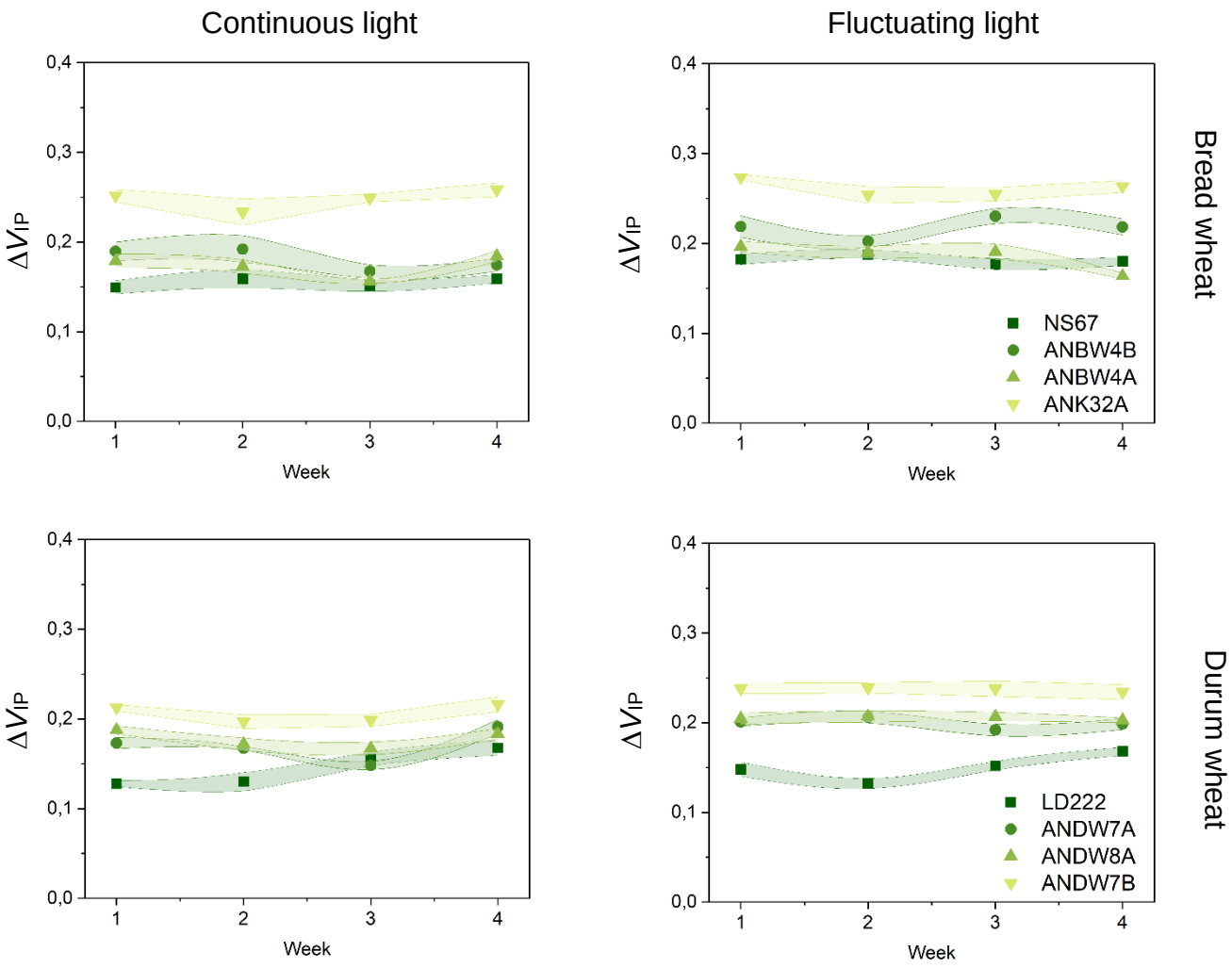
Time-course variation of the maximum quantum yield of PSII photochemistry F_V/F_M in wild-type wheat (NS67, LD222) or chlorophyll-deficient mutants grown under a continuous or fluctuating light regime. Values are means ± SE (represented as a coloured band) of 8-14 determinations.

Supplementary Figure 6



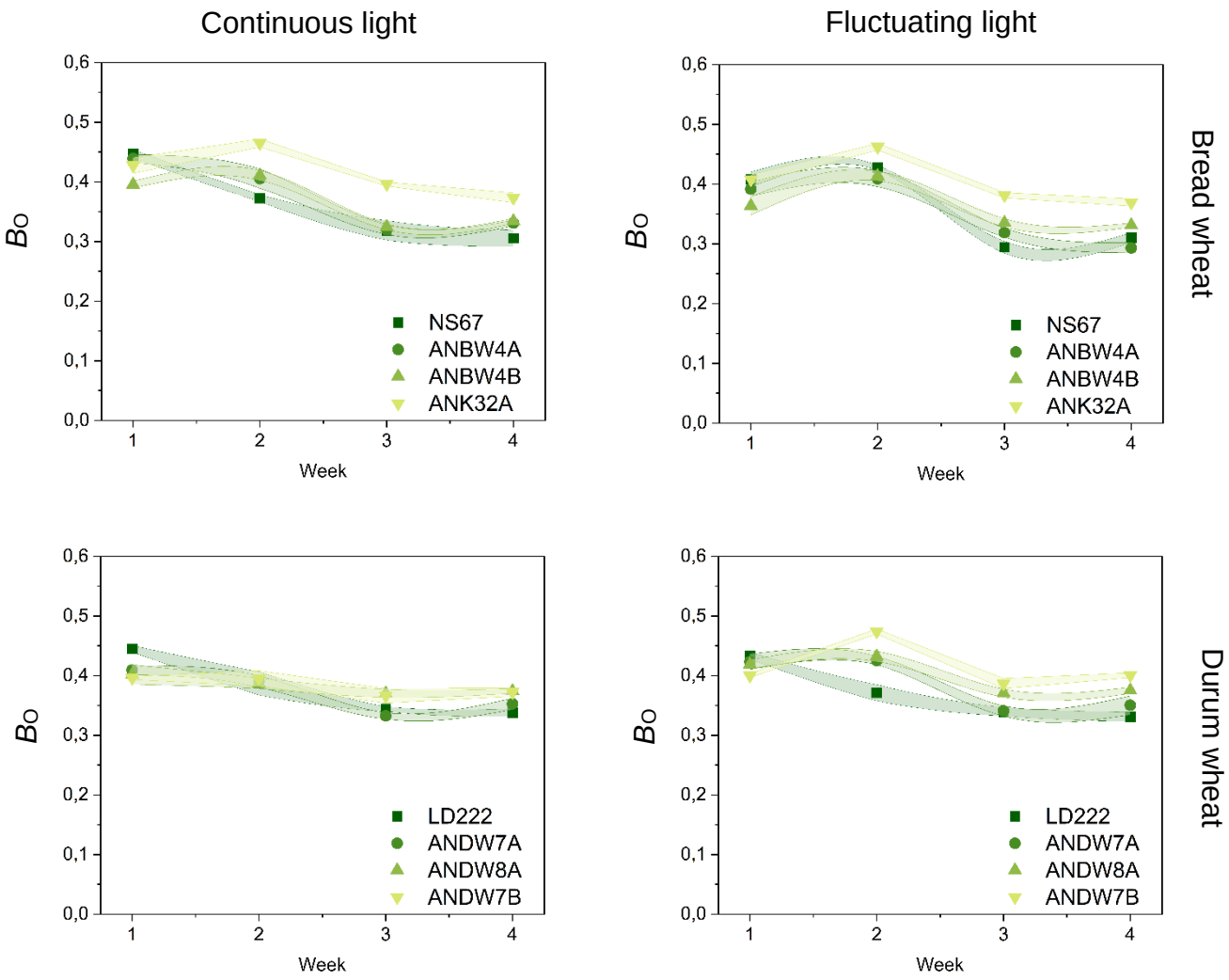
Time-course variation of ΔV_{JP} (1-V_J) in wild-type wheat (NS67, LD222) or chlorophyll-deficient mutants grown under a continuous or fluctuating light regime. Values are means ± SE (represented as a coloured band) of 8-14 determinations.

Supplementary Figure 7



Time-course variation of ΔV_{IP} (1-V_I) in wild-type wheat (NS67, LD222) or chlorophyll-deficient mutants grown under a continuous or fluctuating light regime. Values are means ± SE (represented as a coloured band) of 8-14 determinations.

Supplementary Figure 8



Time-course variation of B_O - the fraction of lost PSII quantum yield (F_V/F_M) during a saturating double hit (two 1 s-long pulses separated by 500 ms darkness) - in wild-type wheat (NS67, LD222) or chlorophyll-deficient mutants grown under a continuous or fluctuating light regime. Values are means ± SE (represented as a coloured band) of 8-14 determinations.