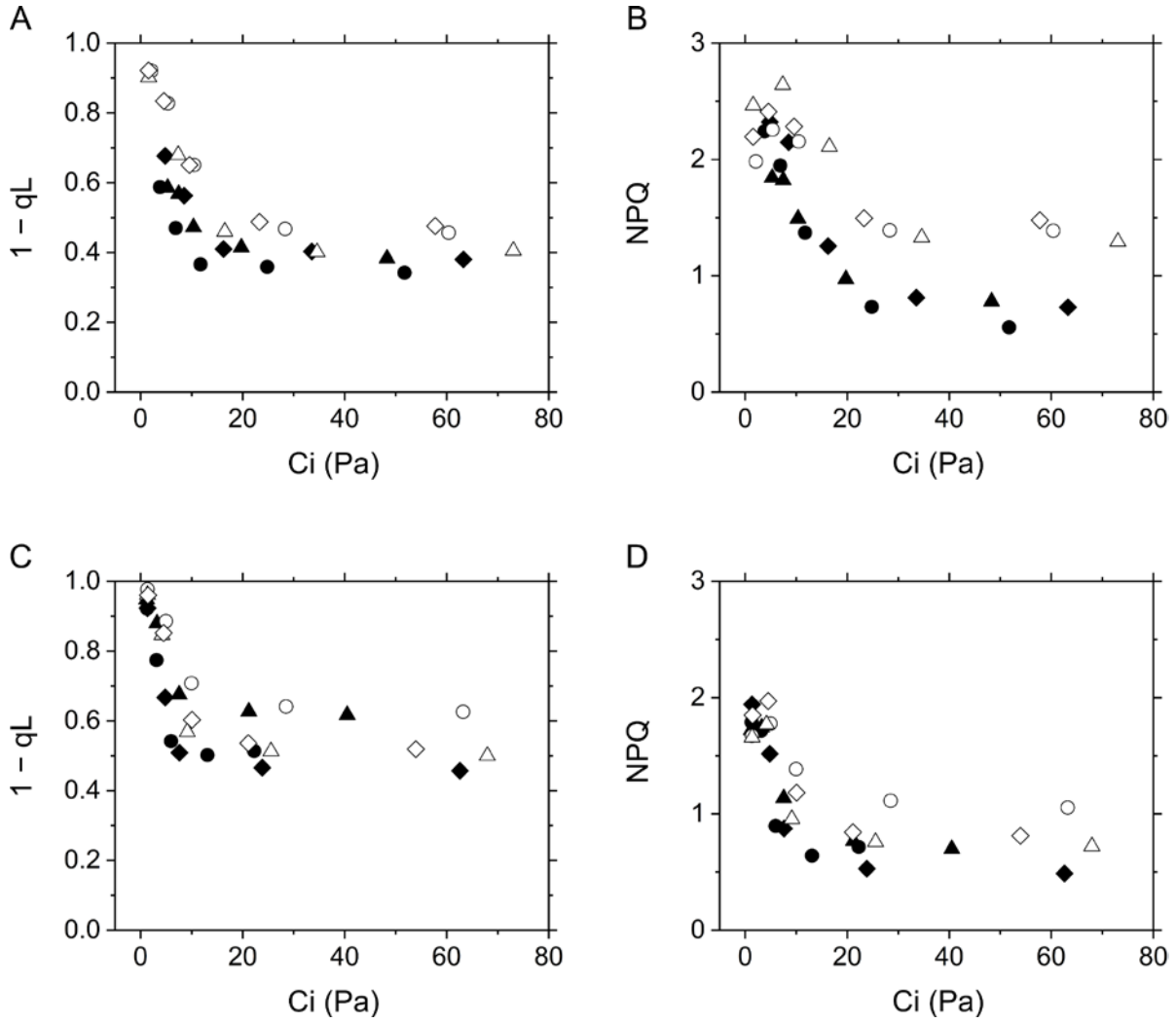
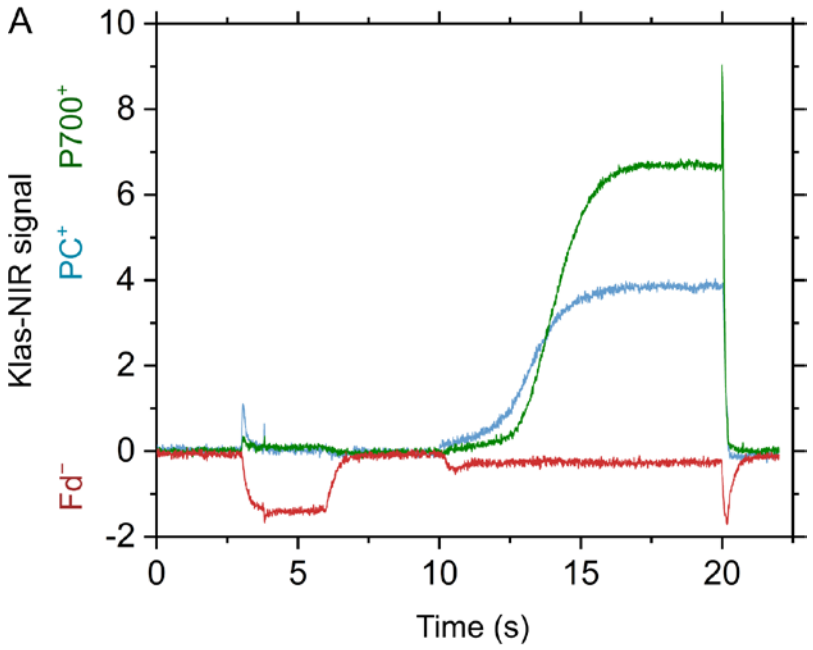
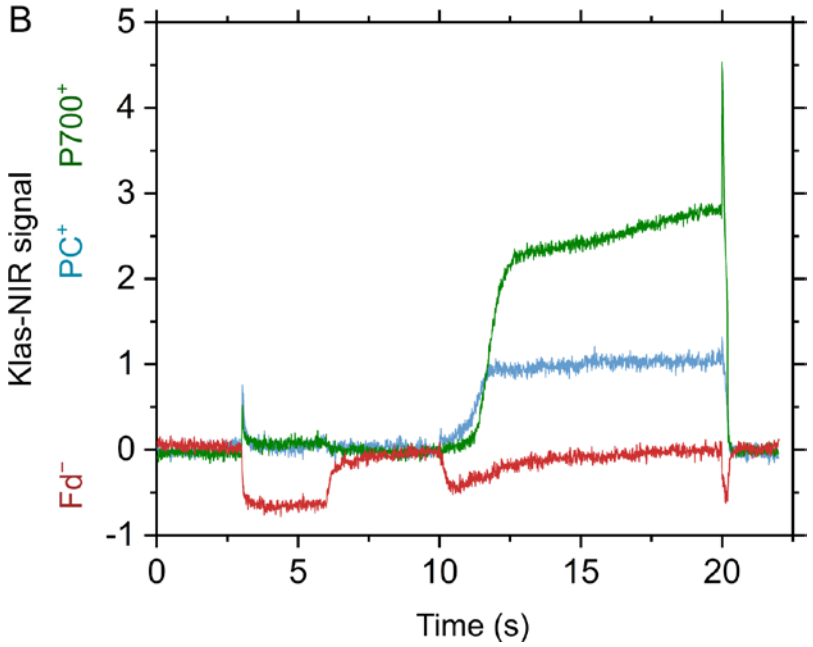
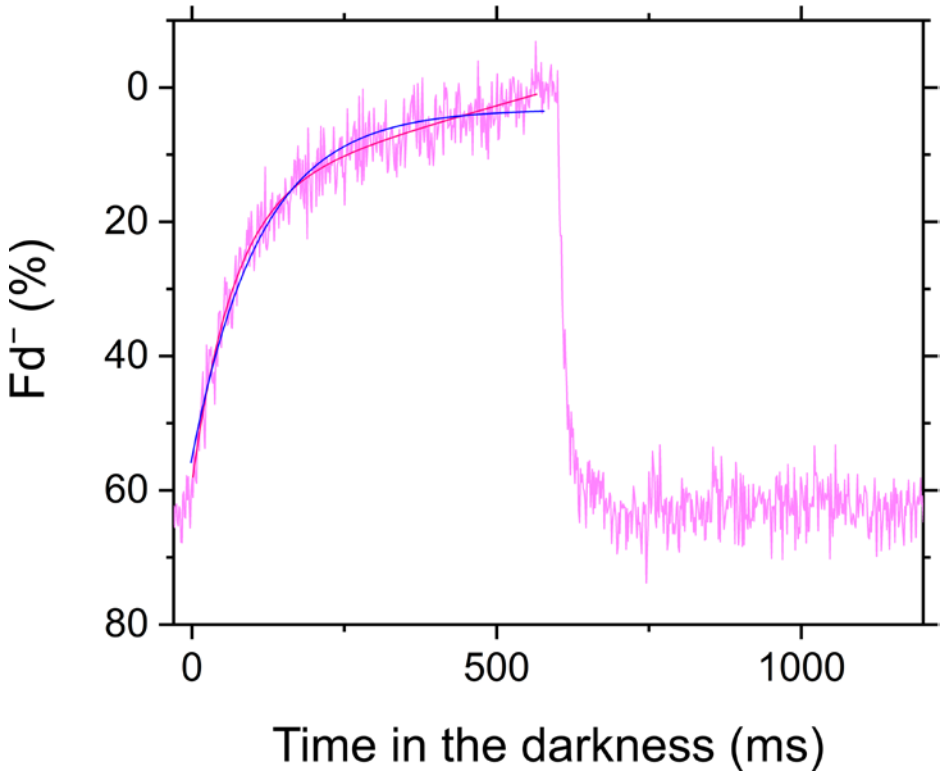


Supplemental Fig. S1. Inferred reduction level of plastoquinone (PQ) pool (1 − qL; A, C) and non-photochemical quenching (NPQ; B, D) at various intercellular CO_2 partial pressures (Ci) in the C_3 plant mustard (A, B) and the C_4 plant maize (C, D). Experiments were conducted independently three times as shown in different symbols (biological replicates) at 21 kPa (closed symbols) and 1 kPa O_2 (open symbols).

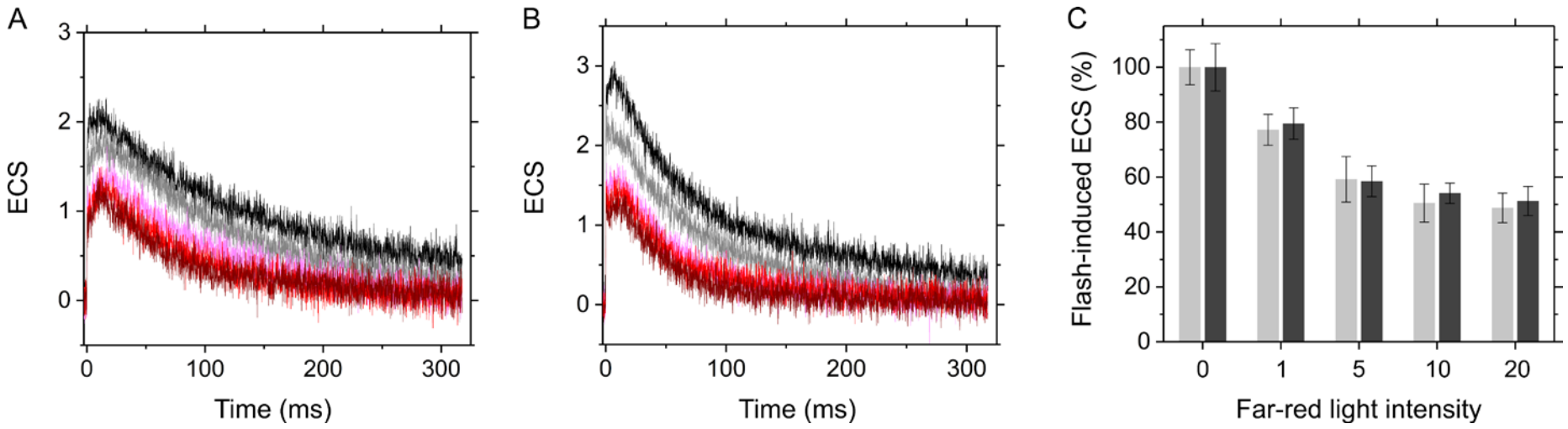




Supplemental Fig. S2. Responses of the redox states of $P700^+$ (green), plastocyanin (PC^+, blue), and ferredoxin (Fd^-, red) to the illumination with red actinic light (3−6 s, 450 µmol photons m^{-2} s^{-1}) and far-red light (10−20 s) in the C_3 plant mustard (A) and the C_4 plant maize (B). Saturation flashes (10,000 µmol photons m^{-2} s^{-1}) were applied at 4 (30 ms) and 20 s (200 ms) respectively. The signal to Fd^- has negative values.



Supplemental Fig. S3. Dark-interval relaxation kinetics of ferredoxin (Fd^{-}) in the C_4 plant maize under low CO_2/O_2 (1 Pa CO_2, 1 kPa O_2). Red actinic light (550 μmol photons m^{-2} s^{-1}) was turned off at 0 ms for 600 ms during the steady-state photosynthesis. The kinetics were fit to mono (pink) and biphasic (blue) exponential decay (R^2, coefficient of determination: 0.9339 and 0.9405, respectively).



Supplemental Fig. S4. Electrochromic shift (ECS) induced by a 5 μs-short saturation flash during far-red light illumination in the C_3 plant sunflower (A) and the C_4 plant maize (B) grown in a field condition. Far-red light was provided at various intensities (0, black; 1, grey; 5, pink; 10, red; and the maximum 20, wine red; the values defined by the Walz software). (C) The flash-induced ECS changes normalized by the values without far-red light illumination as 100%. The data of sunflower (light grey) and maize (dark grey) are shown as the mean with the standard deviation (n = 3, biological replicates).