Variation in chilling tolerance for photosynthesis and leaf extension growth among genotypes related to the C₄ grass Miscanthus ×giganteus.

Fig. S1. Relationship between leaf elongation in warm and chilling temperature for 51 Miscanthus accessions, 2 control sugarcane and 2 maize lines. Plants were grown at 25 °C/25 °C (warm) or 10 °C/5 °C (chilling) day/night, and 12-h-day/12-h-night cycle under 1000 μmol photons m⁻² s⁻¹. Measurements were taken during the day. In chilling, developing leaves were measured during 14 days every other day, while for warm conditions data was collected during 7 days every day. Line presents linear regression for Miscanthus accessions. Data are mean ± SE (n=3). Mol = M. oligostachyus; Msa = M. sacchariflorus; Msi = M. sinensis; Mxg = M. × giganteus.
Fig. S2. (A) Leaf CO₂ uptake rate ($A_{\text{sat}}$), (B) quantum yield of photosystem II ($\Phi_{\text{PSII}}$), (C) stomatal conductance to water vapor ($g_s$) and (D) ratio of intercellular to atmospheric CO₂.
concentration \( \frac{c_i}{c_a} \) for warm conditions prior to chilling treatment, after transfer of plants from warm to chilling (day 0), in 11\textsuperscript{th} day of chilling treatment and one day after transfer plants back to warm (12\textsuperscript{th} day of experiment - recovery). Numbers are expressed as a percentage of rates observed in warm conditions before the chilling treatment. Plants were grown at 10 °C/5 °C (chilling) or 25 °C/20 °C (warm) day/night, and 14-h-day/10-h-night cycle under 1000 \( \mu \text{mol photons m}^{-2} \text{s}^{-1} \). In all panels accessions are ordered according to \( A_{\text{sat}} \) on day 12\textsuperscript{th} of experiment (from highest to lowest; panel A, third bar (black fill) for each genotype). Measurements were taken during day time. For each treatment stage, asterisks indicate significant differences in comparison to \( M. \times \text{giganteus} \) (3x) ‘Illinois’ based on Dunnett’s test (*≤0.05; **≤0.01). Subsequent-time-point values for Mxg (3x) ‘Illinois’ were: (A) 43.86, 39.64 and 86.54 (%); (B) 36.09, 33.49 and 104.45 (%); (C) 91.36, 60.19 and 94.40 (%); (D) 187.70, 153.96 and 111.34 (%). Data are mean + SE (n=4). F1 = the first generation of Msa × Msi hybrids; Msa = \( M. \text{sacchariflorus} \); Msi= \( M. \text{sinensis} \); Mxg = \( M. \times \text{giganteus} \); P1 (high) = parent 1 of interspecific Msa × Msi hybrids (Msa with high chilling tolerance).
Fig. S3. Changes in: (A; C; E; G; I) quantum yield of photosystem II ($\Phi_{\text{PSII}}$) and (B; D; F; H; J) intercellular to atmospheric CO$_2$ concentration ($c_i/c_a$) following transfer of plants from...
warm to chilling conditions. Values are expressed as a percentage of initial rates at time 0. (A–B) accessions at different ploidy levels; (C–D) tetraploid *M. sacchariflorus* (Msa); (E–F) diploid Msa; (G–H) interspecific hybrids (F1) and their Msa parent (P1; high); (I–J) negative controls. Plants were grown at 25 °C/20 °C (warm) or 10 °C/5 °C (chilling) day/night, and 14-h-day/10-h-night cycle under 1000 μmol photons m$^{-2}$ s$^{-1}$. Measurements were taken during day time. Data are mean ± SE (n=4). Low case letters indicate: (“a”) not significant differences or (“b”) significant differences in comparison to *M. ×giganteus* (3x) ‘Illinois’ (bold) on day 11th after transfer to 10 °C/5 °C on the based on Dunnett’s test ($p \leq 0.05$). Values for Mxg (3x) ‘Illinois’ on the day 11th of chilling treatment were: (A) 91.40%; (B) 116.88%. F1 = the first generation of Msa × Msi hybrids; Msa = *M. sacchariflorus*; Msi = *M. sinensis*; Mxg = *M. ×giganteus*; P1 (high) = parent 1 of interspecific Msa × Msi hybrids (Msa with high chilling tolerance).