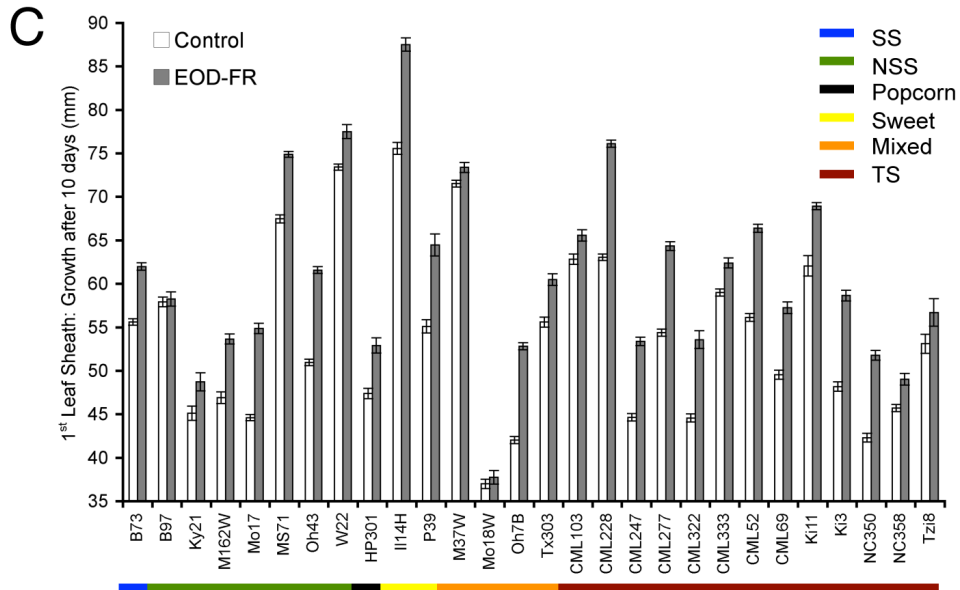
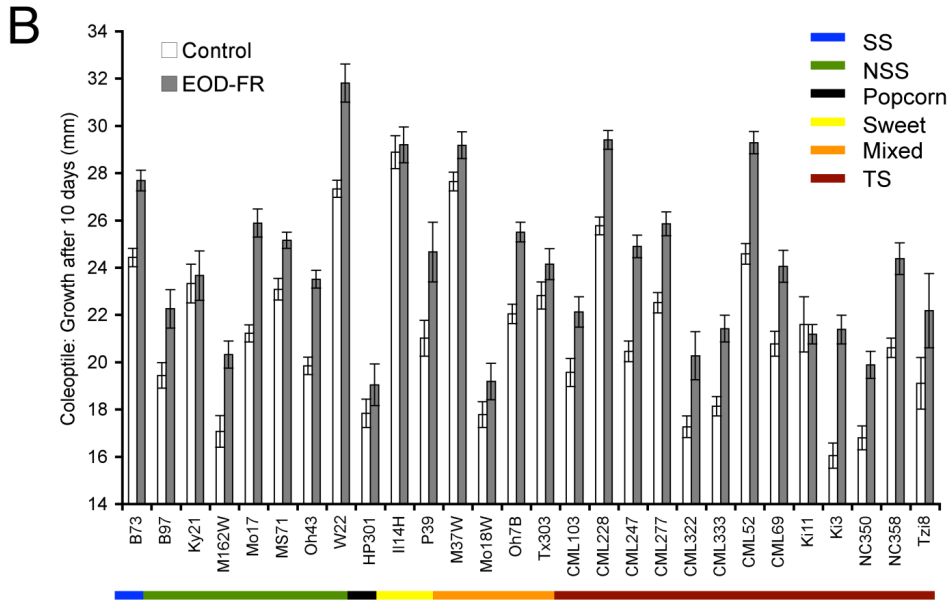
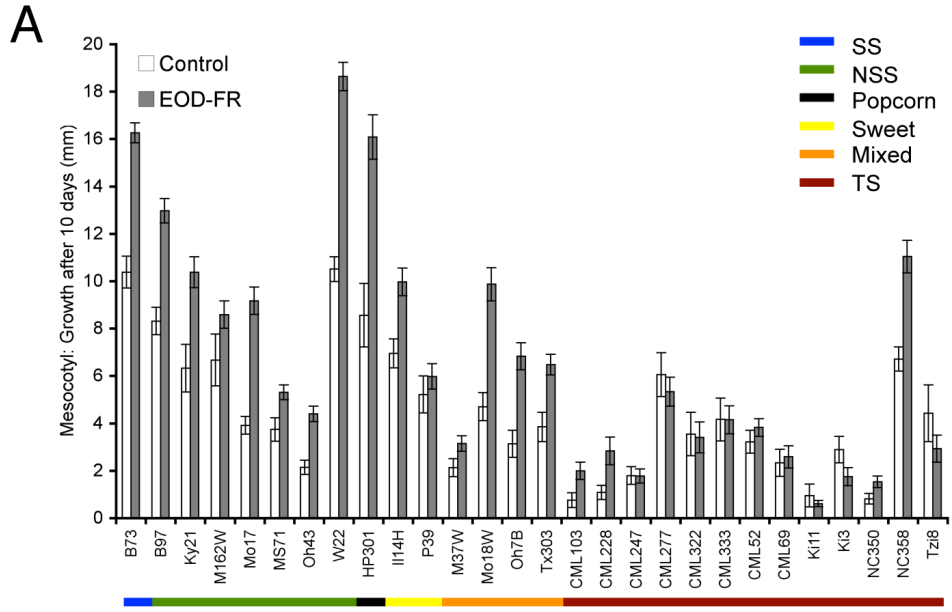
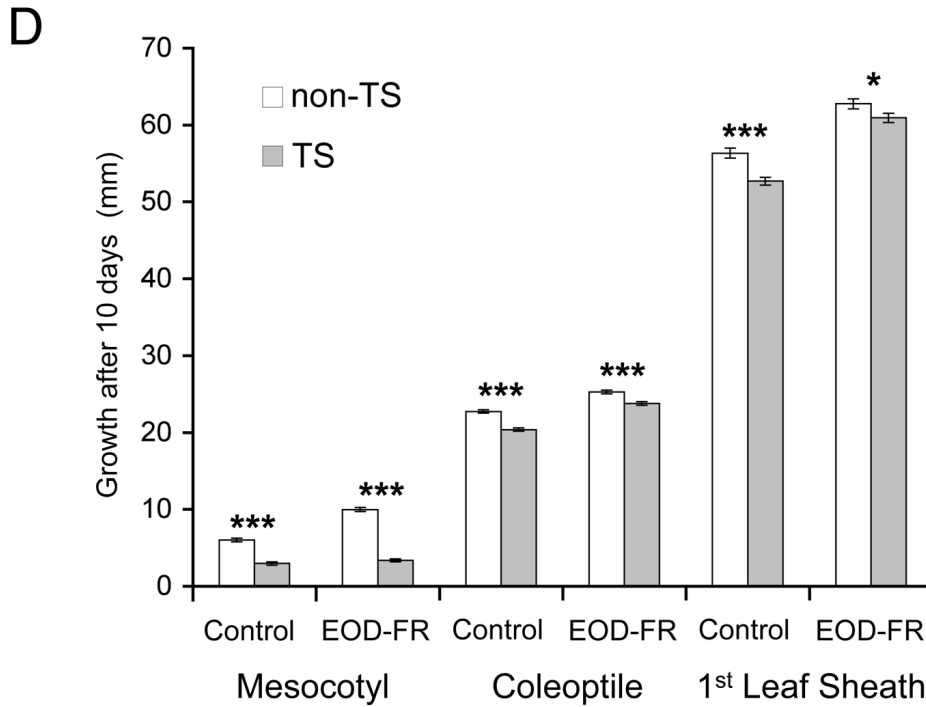
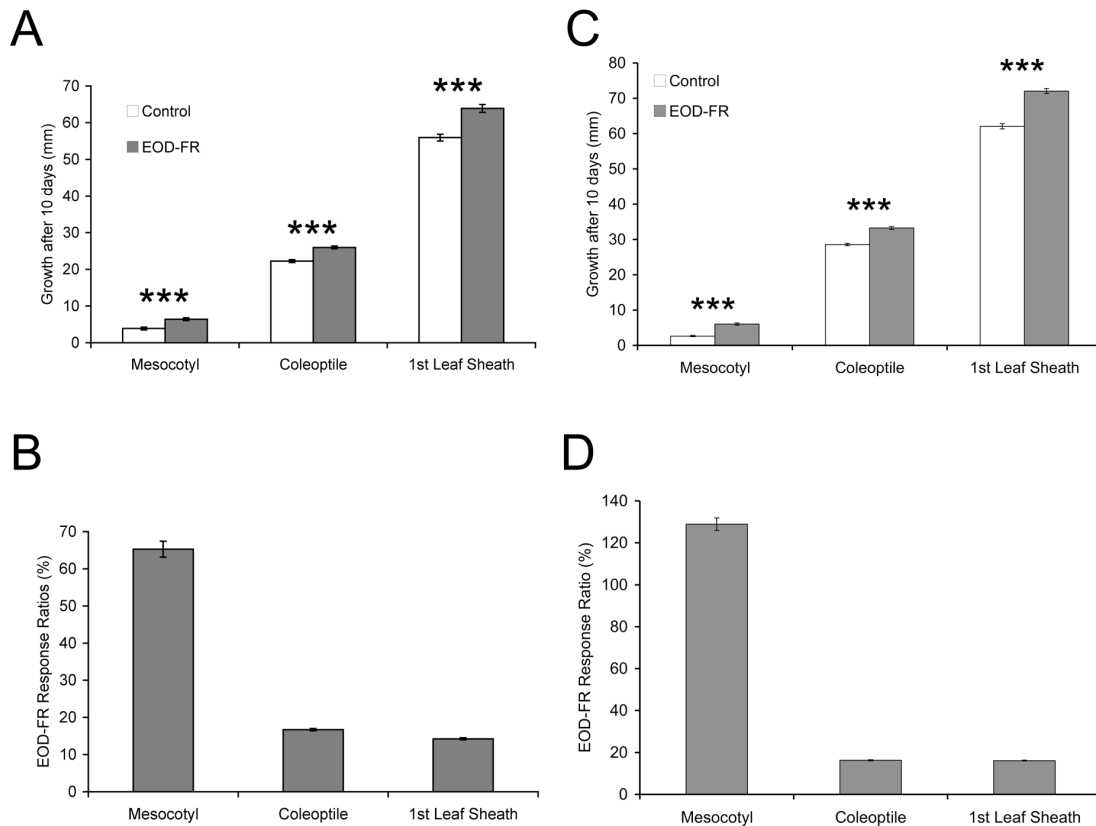


Supplemental Figure S1. Growth chamber design and spectral measurements for light treatments. A, Schematic of the lighting system in each section of the growth chamber. The lower section was used for W control treatments and contains mock equipment to generate a similar distribution of reflected W scatter as upper chamber. The upper section contained R and FR LED banks at the sides of chamber. B, Spectral fluence rate measurements for light treatments. Fluorescent lighting was provided by overhead lamps. Lateral R and FR treatments were provided using either 4 FR LED banks and 2 R LED banks (FR-R reversal) or 6 FR LED banks (EOD-FR only). M, mock equipment.

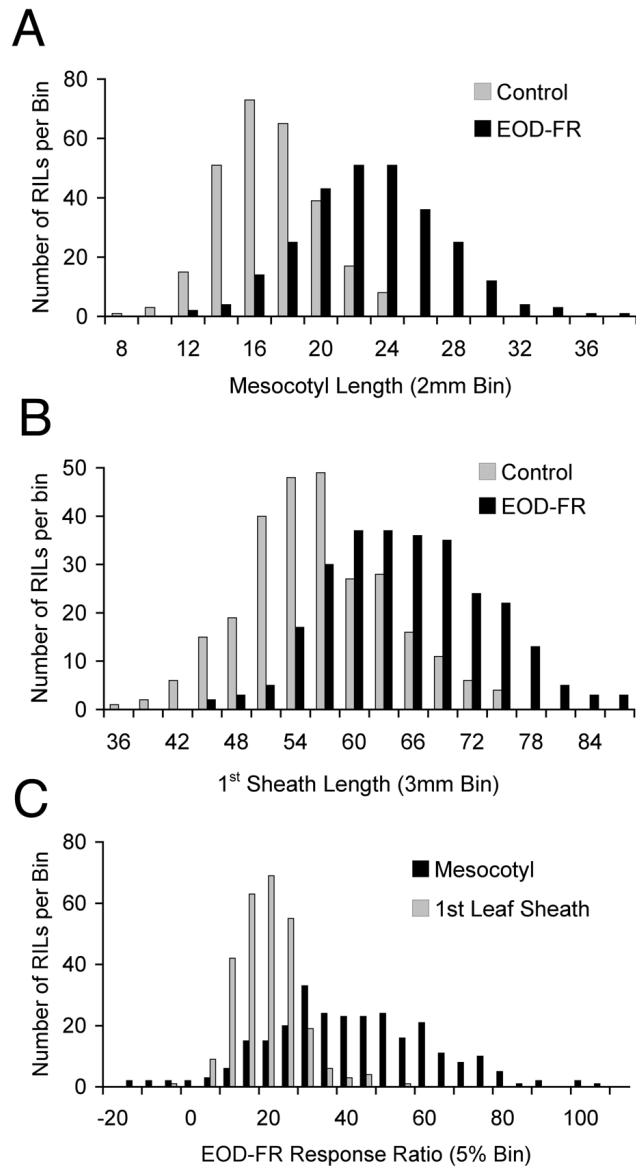




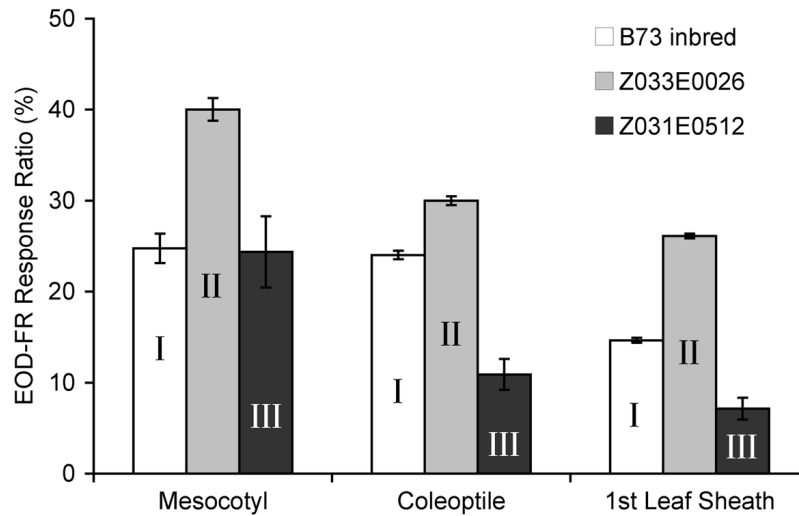
Supplemental Figure S2. Growth responses in a genetically diverse maize inbred panel. A, Mesocotyl length. B, Coleoptile length. C, 1st leaf sheath length. The values represent the mean \pm SE. Student's *t* tests between the W control and EOD-FR treatments for each line and the numbers of individuals used for each line and treatments are presented in Table I. NSS, non-stiff stalk; SS, stiff stalk; TS, tropical/subtropical; non-TS, inbreds from the diversity panel (Table I) that are not of tropical/subtropical origin. White bars, W control; grey bars, EOD-FR treatment. D, Comparison between non-TS and TS inbreds for mesocotyl, coleoptile, and 1st leaf sheath length under EOD-FR and control treatments (* $P < 0.05$, *** $P < 0.001$). White bars, non-TS; grey bars, TS.



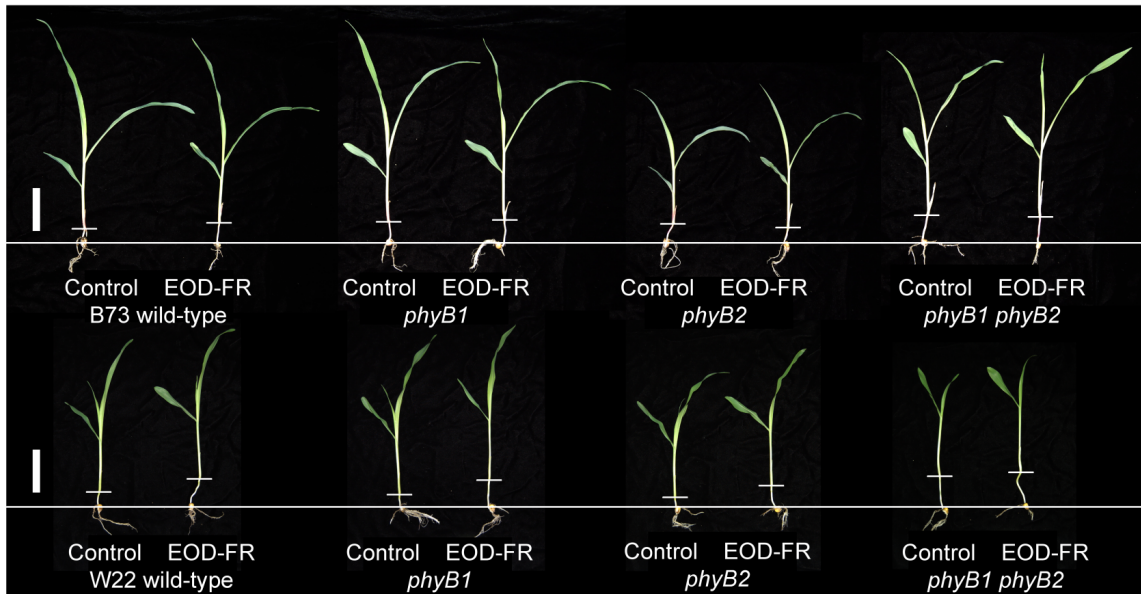
Supplemental Figure S3. Seedling responses to EOD-FR treatments in teosinte (A and B) and maize hybrid 34P88 (C and D). Mesocotyl, coleoptile and 1st leaf sheath lengths 10 days after planting (A and C). The values are representative of the mean \pm SE. EOD-FR response ratios \pm SE (B and D). Number of teosinte seedlings measured for W control and EOD-FR treatments (A) were 85 and 81, respectively. Number of maize hybrid seedlings measured for W control and EOD-FR treatments (C) were 55 and 52, respectively. Asterisks indicate Student's *t* test significance between the two light treatments (***) $P < 0.001$.



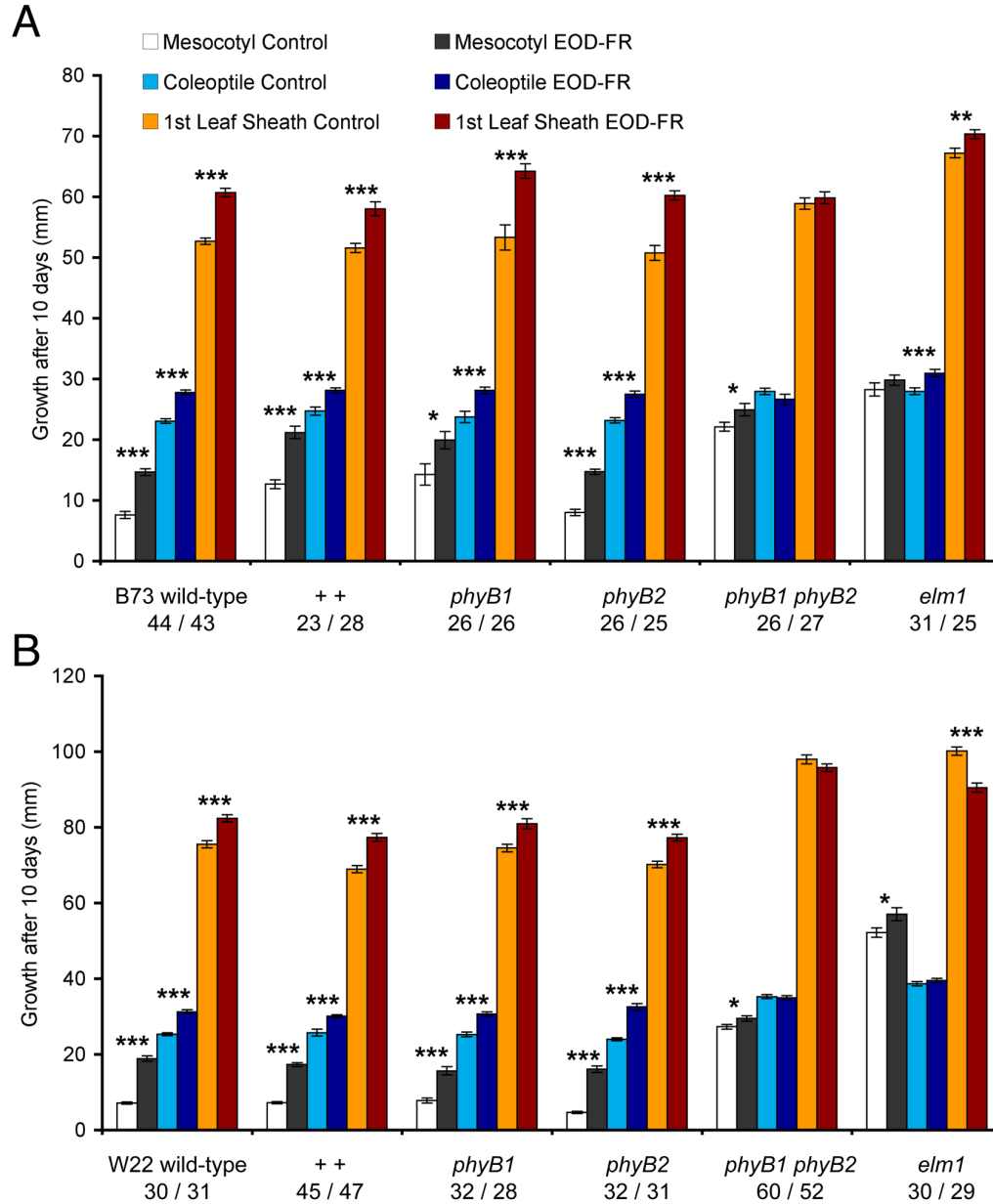
Supplemental Figure S4. Distribution of seedling lengths and EOD-FR response ratios for the IBM mapping population. A, Mesocotyl lengths. B, 1st leaf sheath lengths. C, EOD-FR response ratios for mesocotyl and 1st leaf sheath.



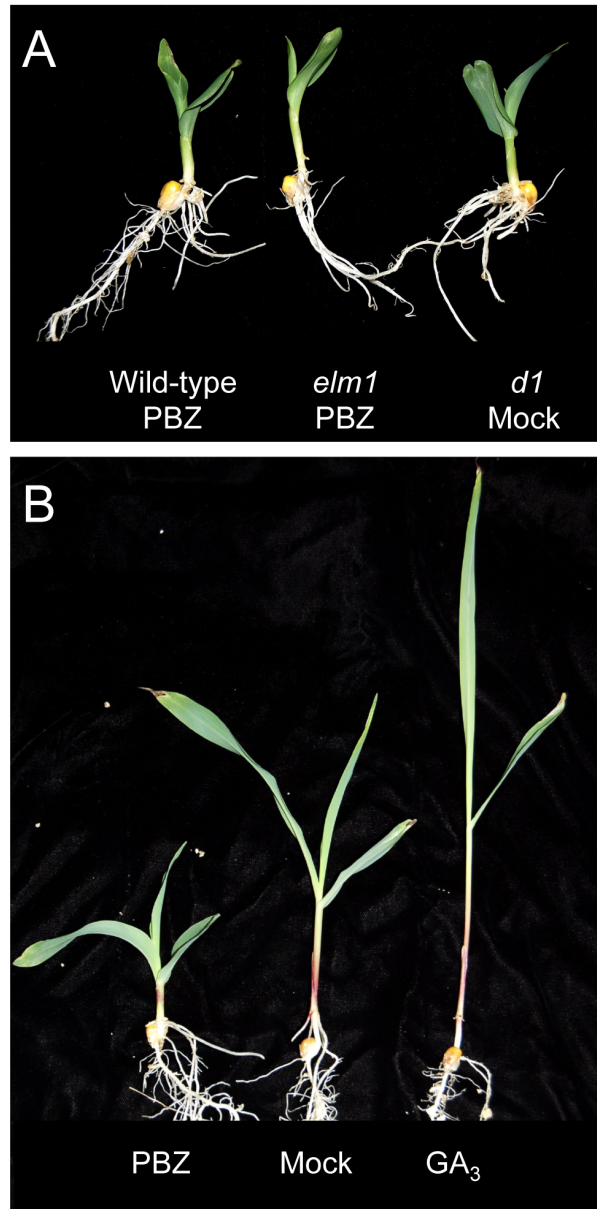
Supplemental Figure S5. EOD-FR response ratios of B73 and B73 NILs containing a teosinte introgression. Response ratios for seedling tissues are shown for B73 and introgression lines Z033E0026 (carries chromosome 9 QTL interval) and Z031E0512 (carries a different chromosome 9 segment). Number of measurements for W control and EOD-FR treatments, respectively were: B73 (33 and 27 for mesocotyl, 64 and 57 for coleoptile and 1st leaf sheath), Z033E0026 (32 and 33 for mesocotyl, 59 and 61 for coleoptile and 1st leaf sheath), Z031E0512 (18 and 19 for mesocotyl, coleoptile and 1st leaf sheath). Both NILs were compared to B73 wild-type using Student's t test. A different roman numeral indicates a P value smaller than 0.05 for each trait.



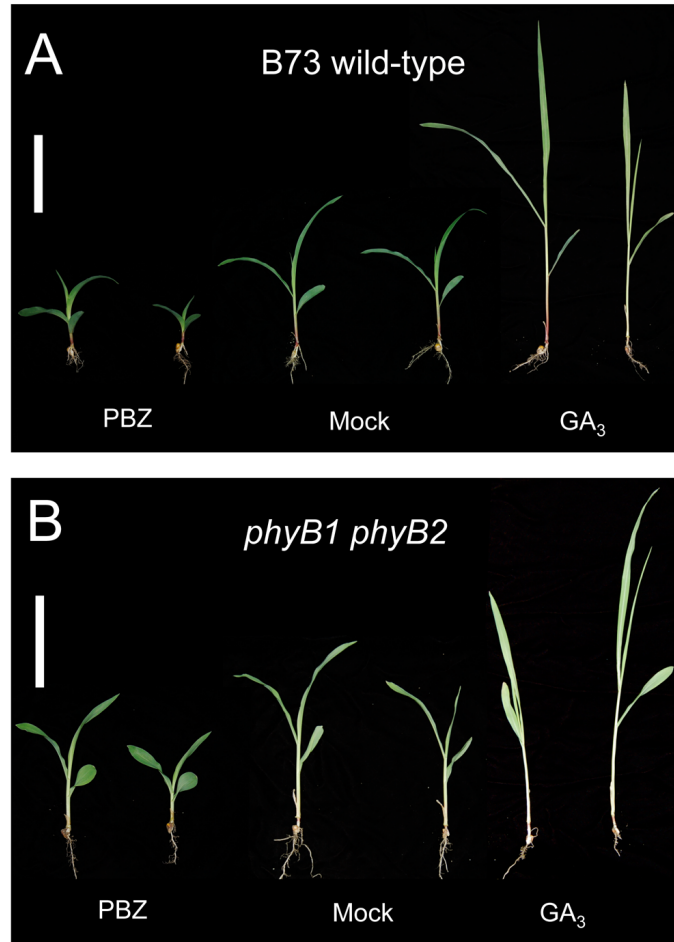
Supplemental Figure S6. Phenotypes of phytochrome *phyB* single and double mutants in B73 and W22 inbreds. Photographs were taken 10 days after planting. The upper panel shows introgressions into the B73 inbred and the lower panel W22 inbreds. Bar = 50 mm. Kernels were aligned along the long horizontal line and the mesocotyl-1st leaf sheath junction is shown by the short horizontal bar.



Supplemental Figure S7. EOD-FR response in *phyB1*, *phyB2*, *phyB1 phyB2* and *elm1* mutants. A, Mutants introgressed into a B73 inbred line. B, Mutants introgressed into a W22 inbred line. The values are representative of the mean \pm SE. The numbers below each genotype correspond to the number of seedlings measured for the W control / EOD-FR treatment. Asterisks indicates significance between the two light treatments (Student's t test * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$). ++, *PhyB1 PhyB2* non-mutant segregant.



Supplemental Figure S8. Effects of pharmacological treatments on maize seedling development. A, 10 day old W22 seedlings grown from PBZ-treated seed, wild-type + PBZ, *elm1/elm1* + PBZ, and the mock-treated *d1/d1*. B, 10 day old B73 seedlings grown from seed treated with PBZ, mock (control), or GA₃.



Supplemental Figure S9. Pharmacological and chill treatments of maize seedlings. A, B73 wild-type and B, *phyB1 phyB2* double mutants were subjected to a nightly chill temperature of 10°C and received either exogenous applications of PBZ, mock-treatments, or GA₃. For each treatment, a single representative seedling is shown. W control is on the left and EOD-FR treated plant is on the right. Vertical bar = 10 cm.