

Legends for Supporting Information

Figure S1. Amino acid sequences of three isozymes of FAD2 from *Brassica napus*.

Table S1. Fatty acid compositions of leaves (A) and roots (B) from *Brassica napus* wild type and two *Bnfad2* double-mutants. Data are mean +/- SE for three plants.

Table S2. Summary information for 39 mutations in the *Brassica napus* FAD2.A1 gene identified in this study.

Table S3. Fatty acid compositions in seeds of *Brassica napus* lines with mutations in FAD2 genes grown in a greenhouse.

Table S4. Distribution of 18-carbon unsaturated fatty acids in seeds of *Brassica napus* lines with mutations in FAD2 genes grown in the field.