

Supplementary\_Figure\_S4: Demonstration of DEFGermplasm platform functionalities using the WRINKLED1 (WRI1) gene family as an example. (a) Cross-species alignment tool results showing the identification of orthologous WRI1 genes across six species—pecan, hickory, Chinese fir, Phoebe, *Arabidopsis*, and poplar—using the *Arabidopsis* WRI1 gene ID as the query. (b) Detailed sequence information of orthologous genes is provided, along with direct links to the genome browser and homology search modules for in-depth analysis. (c) Tissue-specific expression heat maps of WRI1 in pecan and hickory during fruit development highlight dynamic regulatory patterns. (d) Comparative expression profiles of WRI1 in flowers and leaves across pecan, hickory, Chinese fir, and Phoebe underscore its tissue-specific functions across species. (e) Expression distribution of the pecan gene Ci.v01.chr13G04270 across multiple tissues and developmental stages offers further insights into its functional roles.