Pre-harvest sprouting has been reported to cause up to 20-50% yield loss and reduce seed quality. MFT, a homolog of the antagonistic flowering-time regulators FLOWERING LOCUS T (FT) and TERMINAL FLOWER 1 (TFL1) is a proposed ABA-induced negative regulator of ABA signaling that promotes embryo growth in germinating seeds in Arabidopsis. However, in wheat, an MFT homolog is more highly expressed under low-temperature seed maturation conditions and acts as a repressor of germination potential. Peanut varieties have wide variability in their seed dormancy. In the present study, we isolated a peanut homolog of MFT (named as AhMFT) from four peanut cultivars with contrasting pre-harvest sprouting and seed dormancy. GT-C20 is a Spanish-type cultivar with no seed dormancy and severe preharvest sprouting, whereas Tifrunner is a Runner-type cultivar with significant seed dormancy, while SunOleic 97R and NC94022 are intermediate. Phylogenetic analysis suggested AhMFT belonged to the MFT-LIKE classes of the PEBP gene family. Sequence analysis indicated the open reading frame (ORF) of AhMFT from GT-C20 is 100% similar to that from Tifrunner. Expression analysis revealed that AhMFT was highly expressed in seed coats and seeds without coats and was regulated by development. However, expression variation was observed among all four peanut lines during seed development in the greenhouse. The expression variation of AhMFT between GT-C20 and Tifrunner may result from differences in the promoter regions.