Modern tomato (*Solanum lycopersicum*) varieties are bred for uniform ripening (u) light green fruit phenotypes to facilitate harvests of evenly ripened fruit. U encodes a Golden 2-like (GLK) transcription factor, SIGLK2, which determines chlorophyll accumulation and distribution in developing fruit. In tomato, two GLKs—SIGLK1 and SIGLK2—are expressed in leaves, but only SIGLK2 is expressed in fruit. Expressing GLKs increased the chlorophyll content of fruit, whereas SIGLK2 suppression recapitulated the u mutant phenotype. GLK overexpression enhanced fruit photosynthesis gene expression and chloroplast development, leading to elevated carbohydrates and carotenoids in ripe fruit. SIGLK2 influences photosynthesis in developing fruit, contributing to mature fruit characteristics and suggesting that selection of u inadvertently compromised ripe fruit quality in exchange for desirable production traits.