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Identification of molecular tools to enhance yield and quality in wheat

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Wheat is one of the most important cereal crops globally, and its seed serves as a basic unit of propagation, and as source of food, feed and raw material for a wide range of biobased industrial products. Understanding the molecular mechanisms underlying the control of traits of economic importance such as seed yield and quality is critical to design molecular strategies for improving wheat productivity. Seed yield in wheat is determined mainly by the deposition of starch in the endosperm, which is partly regulated by the allocation of photosynthetically fixed carbon to sucrose for transport to the developing seeds and the conversion of this sucrose into starch mainly during the seed filling phase. Consequently, the seeds enter into the maturation phase, which is characterized by the induction of dormancy and desiccation tolerance. Maintenance of moderate level of seed dormancy is crucial in cereal crops such as wheat as this trait is closely associated with tolerance to field sprouting, one of the major constraints encountered in wheat production. Results from our studies with respect to the identification of molecular tools for enhancing starch yield and dormancy will be discussed.