The carbon cycle and plasticity of sink allocation in grapevines growing in diverse climatic environments

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Abstract

The syndrome of dormancy necessarily involves reserve accumulation, whether that be in a seed, in which the process is canalised or entrained, or in a mature plant where the process may be environmentally or developmentally cued. This presentation shows the impact disruption of the phenological cycle when plants are grown outside their 'natural' environment and associated cues. The example presented is that of the cultivation of temperate perennial tree crops in tropical and subtropical environments; grapes – a practice initiated during early colonial periods and now commercialised to meet consumer demand for fresh, perishable products, year-round. Practices have evolved to enable the production of economically viable yields but these are based on agronomy rather than on an understanding of the physiology of the underlying processes, here photoperiod and chilling. Here I will present examples of the consequences and risks associated with traditional practices in the context of the physiological characteristics of the grapevine and offer options for improved practice based on contemporary knowledge of the physiology of phenology and 'dormancy'.