Highlights

* Late spring freezing events, also known as false springs, can be damaging to many plants, with large ecological and economic impacts
* Plants employ avoidance and protective strategies to avoid or tolerate false spring but, with climate change advancing spring phenology, the effectiveness of these strategies may rapidly change.
* Current studies largely simplify the definition of a false spring and fail to incorporate critical factors.
* We show how location within a forest or canopy, interspecific variation in avoidance and tolerance strategies, freeze temperature thresholds, and regional effects unhinge simple metrics of false spring.
* We outline how an integrated approach would rapidly advance progress in ecological and climate change studies.
* We highlight the complexity of factors that ultimately drive a plant’s false spring risk and provide a road map for improved metrics.