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INTEGRATING GENETIC INFORMATION INTO AN ECOPHYSIOLOGICAL MODEL: EXAMPLE OF PEACH FRUIT QUALITY

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Improving fruit quality raises major difficulties. To overcome these difficulties, an interdisciplinary approach has been developed which consists in forwards and backwards between modelling, ecophysiological analysis and quantitative genetics. We applied such an approach to peach fruit quality studying a population of 140 genotypes. The ecophysiological model predicts dry and fresh masses and total sugar concentration in fruit and stone in relation to environmental conditions. QTLs for all the model parameters were detected and co-locations between QTLs for quality traits and QTLs for parameters were observed. QTL results were used to predict, for any genotype of the studied population, the values of each parameter which were integrated into the ecophysiological model. The integration of genetic information into the ecophysiological model may help to solve G x E interactions and to predict the behaviour of plants from the population with any combination of alleles under any climatic scenario.