**Modelling European Agriculture with Climate Change for Food Security**
— a FACCE JPI Knowledge Hub —

FACCE-MACSUR

# Relations between micrometeorological conditions and plant physiology

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## Abstract/Executive summary

The changing climate and environmental conditions play a key role on plant physiology. In this context, crop simulation models represent a useful tool for investigating the main plant processes and provide a reliable estimation of crop productivity and quality. However, the most common crop models showed many limitations, with particular concern on the effect of some meteorological variables on plant processes during sensitive stages of development. Improving models by implementing the effect of such variables on crop processes may help to improve the accuracy of models, thus their usefulness. Here we focus on the analysis of the effect of high and low temperatures during flowering in grapevine. To this, the fruit-set index, developed for taking into account for the effect of temperature on setting the number of berries per cluster and the fruit-set percentage, was applied in a preliminary explorative study to assess the impact of different conditions during flowering at European scales. The sensitivity of the index allowed to identify the differential impact of temperature around flowering in different environment and for different varieties. Once meteorological variables are available at field or sub-field scale, the index can be used to provide information about the spatial variability of crop growth, thus allowing to identify the most appropriate interventions to improve productivity.

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