Veraison as determinant for wine quality
and its potential for climate adapted breeding

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Abstract (250 words)

The evaluation of new grapevine genotypes regarding their potential to produce high quality wines is the time limiting factor in the process of grapevine breeding. Hence, the development of quality-related markers useable in marker-assisted selection (MAS) as well as in prediction models for this bottleneck trait will tremendously enhance breeding efficiency. In extensive studies a training set of a segregating white wine F1 population (150 F1 genotypes = POP150; `Calardis Musqué´ x `Villard Blanc´) was deeply phenotyped and genotyped for model development and QTL analysis.

The high variance in ripening time within this population was identified as major factor influencing the quality potential of the individual genotypes. This is mainly induced by the early veraison locus *Ver1* on chromosome 16 genetically inherited by 'Calardis Musqué'. *Ver1* could be traced back to the early ripening 'Pinot Noir' (PN) clone 'Pinot Precoce Noir' (PPN). Many important quality attributes of the population were directly affected, especially sugars, organic acids, pH value and key aroma compounds. For some of these constituents the *Ver1* locus shows the highest genetic impact in QTL analysis. Understanding the genetic base of ripening and the subsequently resulting effects on quality offers breeders knowledge and helpful tools for the early and efficient selection of genotypes carrying hidden (at least until the first full yield) potential for quality oriented climate-adaption. Furthermore, it enables the implementation of additional selection criteria in marker-assisted selection (MAS), when stacking of resistance loci is no longer the limiting factor in seedling production.

Keywords: climate change, wine quality, cool climate viticulture, marker development.