P26 – Genetic variability of grapevine vegetative development parameters as described with LiDAR data and associated quantitative trait loci

Chedid, Elsa[1]; Avia, Komlan[1]; Dumas, Vincent[1]; Ley, Lionel[2]; Reibel, Nicolas[2]; Butterlin, Gisèle[1]; Soma, Maxime[4]; Lopez-Lozano, Raul[3]; Baret, Frédéric[3]; Merdinoglu, Didier[1]; Duchêne, Éric[1*]

[1]SVQV, INRAE-University of Strasbourg, Colmar, France
[2]UEAV, INRAE, Colmar, France
[3]EMMAH, INRAE-Avignon University, Avignon, France
[4]TETIS, INRAE, Montpellier, France
*eric.duchene@inrae.fr

Abstract

Estimating growth traits of grapevine plants is common practice to describe the effects of cultural practices, training systems, environmental conditions, or genotypic effects, both for rootstocks and scions varieties. Among these traits, the simple pruning weight is one of the most popular, while being time-consuming when hundreds of genotypes are to be characterized. To face the challenge of adaptation to climate change and the global demand for grapevine varieties resistant to disease, there is an increasing need for high throughput phenotyping methods. We studied in the vineyard the variability of plant vigor in the progeny of the cross between two genotypes carrying resistance genes for powdery and downy mildew. The pruning weight was measured for more than 200 genotypes and, in parallel, we used a newly developed high throughput LiDAR acquisition system to characterize the plants both in summer and in winter. We will present the LiDAR system and the comparison between LiDAR data, pruning weights and leaf area. Using "genotyping by sequencing" technology to describe the genetic heritage of the offspring, we performed quantitative trait loci (QTL) detection and identifieds everal genomic regions associated with the genetic variability both for pruning weights; leaf area and LiDAR data.

Keywords: grapevine, pruning wood, leaf area, LiDAR, QTL