Assessment of Tempranillo grapes quality in the vineyard by *Vitur* score-sheet

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• There is a need in the industry for a reliable, rigorous and objective method to assess winegrape quality in the vineyard. Right now, many wineries use *sugar content* – sometimes coupled to TA and pH- to determine quality. Recently, *berry sensory* has gained some interest. The main goal of this study was to determine whether the *Vitur score-sheet*, developed by the University of La Rioja, Spain, could be used as a reliable method to assess grape quality in the vineyard.

• The study involved 25 Tempranillo commercial vineyards in the DOC ("Denominacion de Origen Controlada") Rioja, purposely selected to represent a wide range of soil types, water availabilities, vine ages, rootstocks, and cultural practices. All the vineyards, however, were double-cordon and VSP-trained, spur-pruned to 12 spurs/vine, planted at 2,800-3,500 vines/ha, dry-farmed, and shoot-trimmed in August. For each vineyard, the authors tagged 10 vines and measured the following:

1) **Vitur score-sheet value**: the sheet assesses 11 variables – exposed canopy surface/yield, leaf layer number, leaf condition, water stress symptoms, growing tip presence, vigor, fruit health status, fruit exposure, cluster size, fruit color, and berry size. Each parameter can take one of three possible values, which are later added to obtain the final *Vitur value* (see Vitur score-sheet on page 61 of original text);
2) **growth and yield**: shoots per vine, nodes per shoot, clusters per shoot, crop weight, total leaf area, exposed canopy surface. Pruning weight and yield/pruning weight were also calculated.
3) **grape quality**: "phenolic maturity" (including total polyphenol index, color intensity, total anthocyanins, extractable anthocyanins), Brix, TA, pH, tartaric and malic acids.

• **Results**. When the authors performed a correlation analysis between all the vineyard parameters and the composition parameters, they found that the vineyard parameters fell into 2 distinct groups, those with <u>poor correlation</u> with fruit composition (*vineyard age, pruning weight, yield/pruning weight ratio, total leaf area, exposed canopy surface, total leaf area/canopy surface,* and *leaf health condition);* and those with <u>strong correlation</u> with fruit composition (*yield per vine, exposed canopy surface/yield ratio,* and *fruit health status*). That is, each of the latter parameters was strongly correlated with all 6 positive fruit characteristics measured. But **the parameter that displayed the best correlation with the chemical composition of the grapes was the Vitur value.**

• To mention a few examples, the authors discuss how "yield" showed a strong (and negative) correlation with "total polyphenols index". Similarly, "canopy surface/yield ratio" was also a good indicator of phenolic composition. In contrast, the widely-used "Brix" correlated adequately with only two parameters, "total anthocyanins" and "color intensity", and therefore, it was only a rough indicator of grape quality.

Unit of Viticulture University of La Rioja	VITUR score-sheet for vineyard assessment

GENERAL DATA

Date:	Wine region:
Technician:	Vineyard Code:
Grower:	Vineyard surface:
Rootstock:	Variety and clone:
Type of soil:	Training system:
Row spacing: Vine spacing:	Vine density (vines/ha):

CANOPY DATA

Sv: Shoots per vine:	**Bv:** Bunches per vine:
Bw: Bunch weight:	**Y:** Crop yield (kg/vine):
Hc: Exposed canopy height:	**Wc:** Exposed canopy width:
Wi: "windows" in the canopy (%):	**CSA:** Exposed canopy surface area (m^2/ha):

Criteria	Points			Weighting Factor	Points
	1	**2**	**3**		
CSA/Y (m^2/Kg)	< 0.8	0.8 – 1.2	> 1.2	5	
Leaf layer number	> 4	< 3	3 – 4	2	
Leaf condition (% unhealthy leaves)	> 10%	2% - 10%	< 2%	2	
Water stress symptoms	High or very low	Moderate	Light stress	2	
Growing tips presence	High	Moderate	None	2	
Vigour	High	Low	Moderate	2	
Fruit health status (% bunches with diseases)	> 5%	1% - 5%	< 1%	4	
Fruit exposure (%)	< 20%	> 70%	20 – 70%	3	
Bunch size	Big	Moderate	Low	2	
Fruit colour	Heterogeneous	Light Heterogeneous	Homogeneous	3	
Berry size	Big	Moderate	Low	3	

VITUR Value   (Total points)