RESOLUTION OIV-VITI 593-2019

OIV DEFINITION AND GENERAL PRINCIPLES ON PRECISION VITICULTURE

THE GENERAL ASSEMBLY,

ON THE PROPOSAL of Commission I “Viticulture”,

IN VIEW of article 2, paragraph 2 b i) of the Agreement of 3rd April 2001, establishing the International Organisation of Vine and Wine, and under the point 1.b.i of the OIV Strategic Plan 2015-2019, which foresees to ”characterise and evaluate sustainable production principles and specify the different production methods”,

CONSIDERING the works presented during the meetings of its expert groups and particularly the "Management and Innovation of Viticultural Techniques" Expert group,

CONSIDERING Resolution VITI 4/2006 on Viticulture Zoning, and especially the part concerning recommendations about studying new technologies (remote detection, precision farming…) to enable important progress in zoning operations and manage the natural diversity of vineyard systems,

CONSIDERING the need to identify and compile technical protocols and best practices about precision viticulture techniques which are currently available or in the process of being developed and the requirement for a standardised framework to perform comparisons and uses for different applications between different regions and/or countries,

DECIDES to adopt the definition and general principles on precision viticulture.

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1. OIV PRECISION VITICULTURE DEFINITION

The OIV defines precision viticulture according to references (1) and (2):

Precision Viticulture is a cyclic management approach to field operations based on information and technology tools that uses multiple sources of vineyard-related data to support site-specific decision making with the aim to optimize production processes.

2. OIV PRECISION VITICULTURE GENERAL PRINCIPLES

2.1. Premise

In the past years of the last century, there has been a rising interest in the international vineyard management community regarding precision viticulture.

Precision Viticulture (PV) privileges a range of information technologies for understanding variability in their production systems and to quantify and map variability within-vineyard in order to target management according to the real needs of each part of the field (site-specific management). A number of tools, such as soil proximal (ground) or weather sensors, remote sensing (satellite, airborne or drone-UAVs remote sensing), global navigation satellite system (GNSS), geographical information systems (GIS) and robotics can be used.

The spatial variability of a particular vineyard can be due to any difference in any element or property for each of the natural, biological, agronomic factors which influence vine performance and the expression of grape and wine characters. These factors may be present naturally or due to human activity.

2.2. Fundamental principles

The decision making according to PV principles (site-specific management) is more efficient when:

- The aims of Precision Viticulture application are clearly defined,
- The magnitude of variation is large enough and temporally stable,
- The separate management of delineated zones is possible.

Precision Viticulture has attracted great attention from the vitivinicultural sector because:

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- Grapevine constitutes a high added value crop,
- Vineyards present high spatial variability even in a small area,
- Grapevine metabolism is highly responsive to environmental stimuli.

2.3. Benefits and limitations of Precision Viticulture

Among the benefits of Precision Viticulture we should mention the following:
Improved vineyard establishment

- Define the proper management before each plot is planted,
- Choice of rootstock, variety, densities and training systems for each plot,
- Design of irrigation network, drainage, soil arrangement and plot.

Targeted grapevine management

- Perform variable rate applications (VRA) of inputs (Plant Protection Product growth regulators, fertilization, irrigation etc.) according to the real needs in each plot and more in compliance with the principles of sustainable agriculture,
- Training systems for differential canopy management,
- Differentiated management of each management unit (greening, soil management, erosion prevention, etc.),
- Differential harvest of grapes according to their analytical and sensory characteristics or of their derived products specifications (intended end use), even if they are not in contiguous areas,
- Define traceability bases for all downstream processes.

Economic savings (directly or indirectly)

- Optimization of input costs, works, energy costs etc.
- Balancing cost and benefit for each vineyard zone as a function of value potential,

Increased sustainability of viticulture,
Improvement of sampling and experimental design,

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Facilitation of zoning procedure (OIV VITI 423-2012 resolution).

However, it should be mentioned that there are some limitations in Precision Viticulture:

Maximizing the benefits of PV requires understanding the nature and drivers of variability and providing a link with type of product: grape and wine composition.

The VP OIV general criteria or recommendations must be adapted to each type of product and cannot be generalised to different conditions.

PV may require high technology requirements.

PV should be cost effective.

In particular, the limitations are related to the need for having a global navigation satellite system (GNSS), accessible remote sensor systems, monitoring and static field sensors (measures of climate elements, soil properties, ...), and proximal (canopy analysis), yield forecast parameters and different systems of geographical information (SIG), automatic regulation machinery (eg: applicators of variable dose for diverse inputs), harvest-machines with variable rates and with yield control, etc.

3. REFERENCES

1. Bramley R.G.V; B. Pearse and P. Chamberlain (2003). Being Profitable Precisely – A case study of Precision Viticulture from Margaret River. Australian Grapegrower and Winemaker 473a, 84-87.
2. McLoud, P.R; R.Gronwald and H. Kuykendall (2007). Precision Agriculture: NRCS Support for Emerging Technologies. Agronomy Technical Note, No. 1, 1-9.

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