# RESOLUTION OIV-VITI 569-2018

# OIV PROTOCOL FOR THE SUSTAINABLE USE OF WATER IN VITICULTURE

THE GENERAL ASSEMBLY

On a proposal of Commission I “Viticulture”,

IN VIEW of article 2, paragraph 2 b iii) of the Agreement of 3 April 2001, establishing the International Organisation of Vine and Wine, and under the point 1.C.i of the OIV Strategic Plan 2015-2019, which foresees to ”Propose measures to manage water consumption”;

CONSIDERING the works presented during the meetings of its expert groups and particularly the "Management and Innovation of Viticultural Techniques" Expert Group, and following a proposal made by this group of experts “TECVIT”;

CONSIDERING Resolution VITI 5/1998 on Effects of Drought and especially its recommendations about studying all the scientific, technical and socio-economic aspects, in order to limit serious consequences that result from a lack of water;

CONSIDERING Resolution VITI 1/1999 on Integrated Production and especially the section concerning good environmental practices and to better limit adverse impact on producers and the biological and non-biological environment;

CONSIDERING Resolution VITI 2/2003 on Reasoned Vine Irrigation and all the principles described therein;

CONSIDERING Resolution CST 1/2008 and VITI 422/2011 on Sustainable Viticulture and Sustainable Viticulture for table grapes, and specially the section concerning irrigation practices and water management recommendations;

CONSIDERING Resolution CST 518/2016 on General Principles of Sustainable Vitiviniculture Environmental - Social - Economic and Cultural Aspects and all the principles described therein; and their following guidelines;

CONSIDERING the need to compile all previous information from all OIV Resolutions about water management and their recommendations, before developing any further resolutions in this field such as might be directed to or developed for the issue of “water foot print“;

DECIDES to adopt the following technical protocol for the sustainable use of water in viticulture:



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## Introduction:

Given the consequences related to limited water supply in certain territories or regions and years and the requirement for its effective, most efficient use in viticultural production, there is a need to define good water management practices based on principles of sustainability established in CST 518/2016 resolution.

A more detailed consideration of vineyard sustainability, water consumption and rules about the use of water by all the stakeholders is also important but does not fall within the scope of these guidelines.

While the energy requirements for the manufacture of irrigation equipment and infrastructure, for pumping irrigation water and for the management of drainage warrants attention, these considerations are not detailed in this document but they should be accounted for when considering sustainable use of water in viticulture.

Production practices consume water and may also diminish water quality (1) largely because of drainage, disposal of surplus production inputs and effluent discharge practices. Unsustainable irrigated viticulture may also deplete local surface water stores or aquifers so benefits may be derived from reducing consumption, optimizing water use efficiency and improving the overall water footprint.

In the event of dry farming viticulture becoming non-viable and requiring a move to irrigated operations, improved technologies and techniques, including drip irrigation, Regulated Deficit Irrigation (RDI) and monitoring and responding to the hydric status of the plot or monitoring technologies should be used to secure fruit quality while ensuring good water use efficiency; these management techniques may have secondary effects on encouraging the growth of vineyard ground cover, including weeds.

Viticultural production processes for table grapes, raisins or for juice may require adaptation of the principles and techniques as deployed for wine grapes but will typically demand relatively more water to meet their specific productivity and economic targets; nevertheless, the basic principles outlined hereunder can be adapted to those forms of viticulture.



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# General Principles:

## Site selection and Planning

Regional and landscape planning requirements, hydrological considerations for irrigation supply and/or drainage, and local or regional competition for water should be accounted for in the planning and management of viticultural systems. Under dry climates, vineyard plantation in soils with high or medium water soil reserves may support viticulture without or with minimal irrigation. Recognising the generally expensive investment in irrigation systems, studies done should determine if there is adequate and consistent rainfall to support a profitable non-irrigated vineyard. Alternatively, being able to ensure affordable and predictable access to sufficient water for irrigation purposes is fundamental to the sustainability of irrigated vineyards. The depletion of water from non- renewable aquifers used for irrigation and also, their overexploitation should be avoided. Besides, it will be advisable to take into account the needs of other actual and potential users in the considered territory, to make sure that planned inputs can be assured over a long period.

Although these guidelines cover the sustainable use of water in the field, the following points should also be considered if they fall within the remit of the viticultural department of an organisation/company or grape grower:

- Buildings, equipment, and services related to grapes, wine and raisin production processes along with packaging facilities and all associated infrastructures should be designed, built and managed with due regard to optimal use of water.
- Likewise, those sites which are in regions with hydrographically sensitive drainage basins, high water-table levels or where there is a risk of flood should be avoided unless effective mitigation and management measures can be applied without negative environmental effects.

## Vineyard Water Consumption:

Major drivers of vineyard water requirement, commonly termed the ‘crop evapotranspiration demand’ are the atmospheric conditions – notably, intercepted solar radiation, air temperature and humidity and wind speed - as they interact with - vine canopy, and with the vineyard vegetation floor in determining actual vineyard water requirement (ET vine). This actual value is generally related to monitored and



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reported local evapotranspiration parameters or to models adapted for local conditions.

Consequently, the huge diversity of climates and seasonal weather conditions across the global, planted range of vineyards means that the estimation of water requirement for new plantings and its ongoing supply should be tailored for each situation.

Regional and site conditions and specific planting and training systems, together with yield targets and other production objectives will have considerable influence on the water demand and on the irrigation requirement of individual vineyards. For some situations, a combination of soil type and depth explored by the root system may offer adequate water (easily usable water reserve) to meet vine requirements and to buffer the variability in timing and volume of rainfall. Needs for installation of an irrigation system should be examined by commonly used methods for water demand/requirement assessment.

The role of the rootstocks, vine varieties and clones, training and trellising, canopy architecture, etc. should also be taken into account.

Vineyards located in areas where irrigation is required, e.g. arid to semi-arid areas, should be irrigated with a schedule and volumes guided by monitoring of vineyard water status in order to optimize water use efficiency. At the same time, the manager must be mindful of the need for adequate drainage (a leaching fraction) to ensure soil salinity is maintained in a range tolerable for grapevine function.



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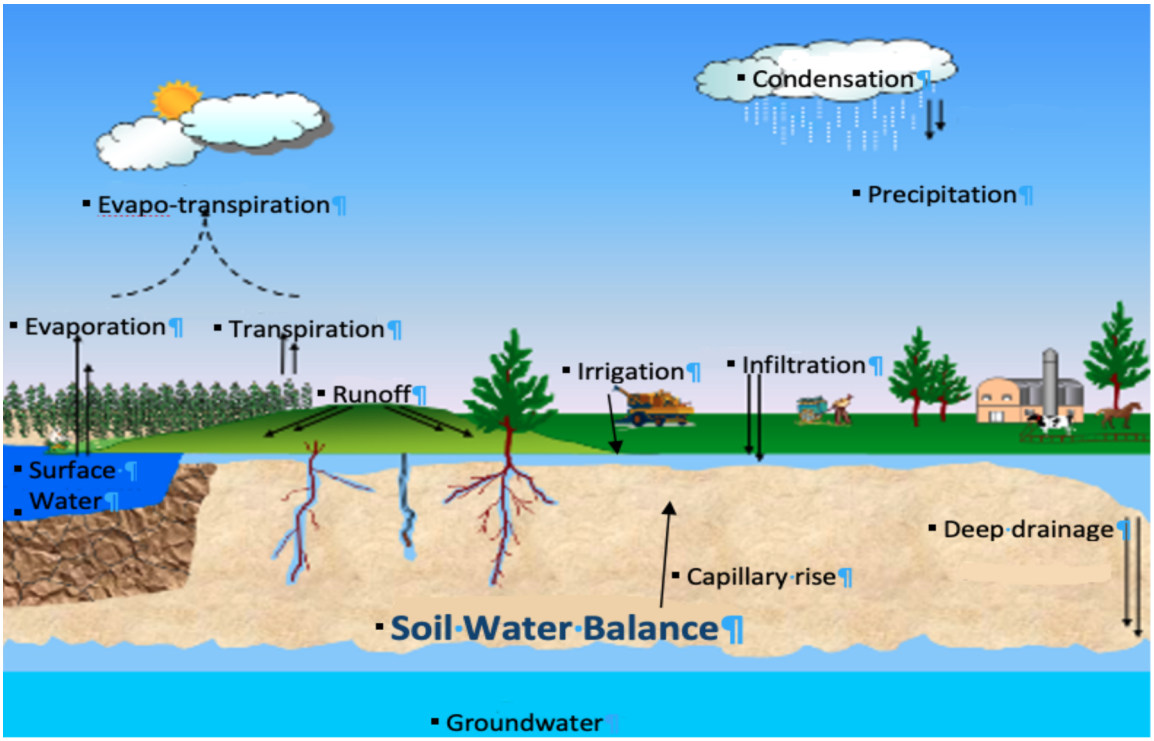



*Figure 1. Water cycle adapted from references (2) and (3).*

Grapevine varieties and clones can successfully adapt to water stress across a wide diversity of conditions, especially when combined with appropriate rootstocks.

Where soil and climatic factors cause frequent and/or severe drought (and full irrigation possibilities are reduced), it is strongly recommended that selection of appropriately adapted or tolerant scion/rootstock varieties and clones, training system combinations adapted to site conditions be undertaken at the outset of vineyard development.

Thereafter, benefits can be achieved from optimisation of water supply volumes in relation to the following: vine plant material, training and trellising systems, production quantity and quality objectives as may be redefined from time to time and in response to the variation in seasonal weather conditions. Seasonal adaptation strategies may include soil management (e.g. cultivation or cover crop management, etc. to regulate water balance of mid rows or to manage competition for water supply), summer pruning techniques (shoot thinning and trimming), crop level regulation by green harvest, etc.

Sustainable water use will be attained from the appropriate selection and



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management of vineyard, planting material, soils and inter-row vegetation, and the delivery of adequate water supply in a timely manner with minimal deep drainage, runoff or evaporative loss.

Finally, other practical guidelines could be taken into account according to further OIV expertise's documents, like "OIV specific guidelines for the sustainable use of water in viticulture" that will be published and continuously updated.

## References

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2. Taikan Oki, T., Shinjiro, K. Global Hydrological Cycles and World Water Resources. Science. 25 Aug 2006: 1068-1072.
3. Van Leeuwen; C; T. Dufourçq; N. Ollat; J.-P. Roby; E. Goulet; P. Pieri; E. Lebon; X. Delpuech; C. Debord; E. Neethling; H. Quénol; G. Barbeau (2014). Gestion du régime hydrique de la vigne. Ed. IFV, 43p.



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