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### **Review after two years of implementation**

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# **PERFORMANCE PULVÉ®: a labelling system for vineyard sprayers based on their performance in terms of spray quality and potential for PPP dose reduction. Review after two years of implementation**

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## **INTRODUCTION**

PERFORMANCE PULVÉ® is a sprayer labelling system that guarantees the performance of vine sprayers through ratings on their spray application quality and their potential for reducing the use of plant protection products. Set up in 2021, PERFORMANCE PULVÉ® is a service designed for wine growers and their advisers to help them to choose their sprayer. The service also provides advice on sprayer settings to optimize protection efficiency. Sprayers ratings are used by several institutions in France to release subsidies for the renewal of the sprayer fleet. The ratings attributed to sprayers by PERFORMANCE PULVÉ® are based on the results of sprayers tests carried out on the EvaSprayViti test bench, an artificial vine that mimics different growth stages and ensures the standardization of spray tests (Codis et al., 2013).

## **MATERIALS AND METHODS**

The project started concretely in 2013 with the development of the EvaSprayViti test bench by IFV (French Institute for Vine and Wine) and INRAE (French national research institute for agriculture). The EvaSprayViti test bench is a modular artificial vine composed of 4 rows of 10 meters used for measuring the deposition on the canopy in standardized conditions. The test bench can mimic three vegetative stages of the vine (early growth stage, middle and full growth stage), which makes it possible to assess the sprayers over the entire vegetative cycle of the vine. Between 2014 and 2018, dozens of sprayers sold on the market were tested on EvaSprayViti according to the methodology developed by IFV and INRAE. This made it possible to identify significant differences between sprayers and validate the interest of building a classification. Trials were carried out in collaboration with sprayers manufacturers and with the support of the local Chambers of Agriculture. In 2018, IFV and INRAE had gained sufficient references to define a sprayers classification method based on thresholds linked to the average deposition and its distribution inside the canopy.

Following the trials on the EvaSprayViti test bench, detailed performance ratings (A+, A, B or C) are assigned to the sprayers for each of 3 the vegetative stages (early, half and full growth stage). These ratings reflect different capacities to reduce the amount of PPP used while maintaining deposition on the vegetation at least equivalent to those produced by a reference sprayer used at full dose rate (Vergès et al., 2017). In addition, a synthetic notation, in the form of a class, gives an overall view of the sprayer's performance all around the vegetative season taking into account the detailed ratings obtained for each growth stage. 7 performance classes have been defined (from 1 to 7), class 1 being the most efficient.

In 2017, a Steering Committee was set up to collectively agree on the rules for the labelling system. This multidisciplinary committee has representatives from the Ministry of

Agriculture, local Chambers of Agriculture, CIVC, AXEMA (French agricultural machinery Association), Phyteis (French Crop Protection Industry Association), INAO (National Institute of origin and quality) and Regional Councils. The committee has drawn up the governance charter that defines all the rules for classification of the sprayers. This committee made it possible to develop the labeling system in a collectively validated and supported direction, consulting all stakeholders throughout the decision-making process.

A second working group was established in 2018: the PERFORMANCE PULVÉ® Technical Commission that analyzes the application files provided by the manufacturers and the results of the trials and then makes the decision to classify the sprayer according to the rules laid down in the governance charter. The Technical Commission is made up of independent experts specialized in spraying, coming from the different wine growing regions in France. To date, the Technical Commission is composed of 8 agricultural equipment advisors from the Chambers of Agriculture and the Comité Champagne. The Technical Commission began the evaluation of the first files for sprayer evaluation in January 2020.

In 2019, the decision was made to award qualification at the level of the sprayer unit by issuing a PERFORMANCE PULVÉ® certificate. This certificate is specific to the machine unit and contains the serial number of the machine. It also includes, through the detailed sheet that accompanies it, the detailed and the synthetic ratings obtained as well as the conditions under which the ratings are awarded. The certificate specifies, among other things, the settings, and the range of inter-rows for which the qualification is delivered.

## RESULTS AND DISCUSSION

In total, 21 different manufacturers have carried out sprayer tests on EvaSprayViti with at least one of their machines. To this date, 25 models of sprayers with more than 120 manufacturable variations from 16 different brands have been qualified. The PERFORMANCE PULVÉ® internet platform available since December 2020 on <http://www.performancepulve.fr/> references all the qualified sprayers. The platform allows: (i) winegrowers and advisers to browse the list of referenced sprayers as well as their detailed factsheets, (ii) the manufacturers to edit the certificates for each machine unit of the referenced model, (iii) institutions that use PERFORMANCE PULVÉ® to guide subsidies may proof the certificates of the sold referenced sprayers using the serial number. To ensure the long-term success of the approach, the challenge is twofold: to continue disseminating and transferring the service to the various operators in the sector, and to have PERFORMANCE PULVÉ® recognized as a support for future investment subsidies (EAFRD).

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