

ANNEX 2

Draft Document

DETECTION AND PREDICTION OF WINE-GROWING RISKS:

"Diseases, pests and climate risk: new and future tools at the service of Viticulture."

The Final Document will look like this after the addition of your proposals

**1 Titles of Tools or Models
(see next page)**

	Area	Name	Company / Institute	Sensor Carrier	Technology	Marketed / Diffused
Sensor	Disease Forecast model system	Canine sense of smell	Valentin/CIVC	Embarked land based	Biologique	
DST	Disease Forecast model system	Potential Systems	SESMA/IFV		Modèle	X
DST	Disease Forecast model system	Vite.net	Horta		Modèle	X
DST	Disease Forecast model system	Movida	ITK/Bayer		Modèle	X
DST	Disease Forecast model system	Portal weather	CIVC	internet	Modèle	X
DST	Diseases mapping	Epicure	IFV		Modèle informatique	X
DST	Vineyard mapping and Disease Forecast Model System	Vintage HMI	GaiaG s.r.l.		Imagerie et modèle informatique	X
DST	Disease Forecast model system	Quaderno di Campagna or QdC®	Plateformes Image Line s.r.l,		Modèle informatique	X
Sensors DST	Disease Forecast model system	RotBot™ Predict	New Zealand Institute for Plant Food Research Ltd	Pedestrian	Imagerie et modèle informatique	X
DST	Diseases mapping	Treatment Plan Optimized	IFV		Modèle informatique	
DST	Quantifications of Powdery Mildew on on berries in the vineyard	Powdery mildew assessment tool (PMapp)	Adelaide Research & Innovation Pty Ltd			X
DST	Doses model for Diseases	Optidose	IFV		Modèle	X

2. Description of the Model or Tool.

Sensors:

Canine sense of smell: VICC, France (<http://www.champagne.fr>), **Valentin**, Exploratory technique aimed at the detection of attacks of parasites (before the appearance of symptoms) by dogs and » Sniffer dogs brought in to protect the grapevines”

<http://www.sheppnews.com.au/2017/05/09/87723/sniffer-dogs-brought-in-to-protect-the-grapevines>

Decision support tools (DST):

Potential systems:

SESMA (<http://www.sesma.fr>) and **IFV**, or French Institute of Vine and Wine (<http://www.vignevin.com>), France. Modeling systems of diseases of plants including the vine (mildew, powdery mildew, black rot). They are based on the work of S. STRIZYK and resulted in the potential system models. Potential system templates only work from weather rainfall and temperature data. A local setup, based on the available weather data history, assures its adaptation across a vineyard or within a homogeneous climate area.

The model thus calculates the climate gap recorded against this standard and assesses the impact of this differential on the State of development or aggressiveness of the parasite. Models indicate the epidemic risk, parasitic pressure level and forecasts of contamination.

Vite.net: Horta (<http://www.horta-srl.it>), Italy. The proposed application is a web-based assistance service for the management of the vineyard that meets the needs of enduring access to information on environmental conditions, the situation of the vineyard, the presence and evolution of insects and diseases to enable growers to make decisions consistent with the principles of sustainable viticulture with integrated production.

Movida®: Bayer (<http://www.bayer-agri.fr>), France. Is a (software) tool that helps to manage the vineyard against oidium and mildew protection. It models the epidemiological risk. It allows the building of programs to combat major diseases of the vine that are appropriate for the plot. Users can operate interactively via the program to evaluate vineyard oidium and mildew protection, manage contamination alerts and build treatment programs.

Portal weather: VICC (<https://meteo.comitechampagne.fr>), France. This subscription-based portal is a tool for decision support developed to assist producers in the implementation of four key principles: respect for the natural balance and prevention of pest and disease, risk assessment (tracking the weather, warnings, fragmented observations, taking into account the relevant action levels), choice of less dangerous products for man and the environment control applications and particularly the quality of spraying. This portal is based on a network of automatic weather stations, epidemiological models, warning by fax or Internet systems, a network of surveillance (Magister).

Epicure: IFV (<http://www.vignevin-epicure.com>), France. EPicure is an information system around vine disease modeling. Information (SI) EPicure system relies on different tools to assist the grower in making his best decision: models potential system (prediction of epidemic risks in viticulture models, see above) and networks of weather data (weather and radar stations) for providing the necessary model input parameters.

Vintage HMI: GaiaG s.r.l., (<https://www.gaiagsat.eu>), Italy. Final version of a European programme, VINTAGE HMI or **H**uman **M**achine Interface, gives a geographic representation of the vineyards and offers models for prediction of risk or other type of modeling products and tools to support the decision (use of ESA and NASA satellite data) combined with data from sensors on the ground or aboard aircraft and drone.

QdC® or Quaderno di Campagna: platforms Image Line s.r.l., (<http://www.confindustriaravenna.it>), Italy. Quaderno di Campagna or QdC® (the orchard in French) is a commercialised decision support system. It is a web application designed for producers and wine technicians to help manage sustainably the diseases and pests at various stages of production.

RotBot™ Predict: New Zealand Institute for Plant & Food Research Ltd. Partnership with HortPlus (<http://rotbot.co.nz/rotbot>), New Zealand. New Smartphone application that includes the ability to estimate the level of attack of botrytis on white grapes **of RotBot™** in connection with risk forecasts which help the grower to predict and manage attacks of rot gray at the level of his vineyard.

Powdery Mildew Assessment Tool (PMapp): Adelaide Research & Innovation Pty Ltd (<http://www.adelaideresearch.com.au>) Australia. Smartphone software to support the estimation of powdery mildew on the surface of the clusters to the plot. The software includes an estimate function that allows recording of the intensity of oidium as estimated for each cluster (frequency). The screen shows the total number of clusters counted, the frequency and intensity of the disease. The data can then be sent by email for further processing. The system has a training tutorial (139 images of clusters with surfaces shaded representing a scale of 0 to 100% attack severity and a possibility of self-calibration of the user..

Optimization of phytosanitary and other treatments

Treatment Plan Optimized: IFV, (www.vignevin-lr.com), France. The Plan of Treatment Optimized (PTO[®]) Protocol has been developed for application in precision and sustainable viticulture. In a first phase, data was collected on the vineyard for mapping soil and vegetation cover, the deficits in water, the harvest potential. These data have been incorporated into GIS (geo-referenced information system) that provides a single repository with layers scanned for spatial analysis of the vineyard. The PTO[®] prioritizes and combines explanatory information of the epidemic risks between them and the translated as a value record corresponding to the dose of the plant protection product necessary to stop the infection of the disease at a given point. It allows an appropriate response to the epidemic risk assessment.

Optidose: IFV, (www.vignevin-lr.com), France. The Optidose[®] program offers a cost-effective protection strategy for the vineyard in regard to plant protection products and enables maintenance of a satisfactory level of protection. The ultimate goal of the program is to approach the minimum quantity of active ingredient per cm² of plant sufficient to ensure the full effectiveness of the treatment. It requires measures of biomass (currently, mainly experimental techniques). The Optidose[®] algorithm offers for mildew and oidium an adjustment of the dose of plant protection product based on the template of vegetation (volume to protect), pest and disease stage and vine phenology. The performance of the sprayer must be taken into account in the calculation of doses, although currently this has not been developed.