

AfterLIFE Plan

2020 – 2022



LIFE15 ENV/IT/000392

VITiculture Innovative Soil Organic Matter
management: variable rate distribution
system and monitoring of the impacts



Project Data

Project Title	“VITiculture Innovative Soil Organic Matter management: variable rate distribution system and monitoring of the impacts”
Abbreviation	Life VITISOM
Reference	LIFE 15ENV/IT/000392
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Coordinating beneficiary data

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The partnership



University of Milan – Environmental and Agricultural Department of the University of Milan



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



University of Padova – Department of Agronomy, Food, Natural resources, Animals and Environment



Consorzio Italbiotec



Castello Bonomi Tenute In Franciacorta



Azienda Agraria Degli Azzoni Avogadro Carradori



Guido Berlucchi & C. S.p.A



Casella Macchine Agricole Srl



West Systems S.r.l



The importance of soil organic matter for a healthy soil

Soil organic matter consists of organic material of animal or plant origin at different stages of decomposition, caused by the activity of microorganisms present in the soil. It contributes to the biodiversity of soil and is the main responsible of the soil fertility and quality. Soils that contain more organic matter are equipped with a better structure that promotes water infiltration and reduction of soil susceptibility to compaction, erosion and landslides.

Therefore, the degradation of soil organic matter content is considered one of the most serious causes of soil degradation.

Modern viticulture presents growing threats to the erosion of organic matter

compared to the past, due to the tendency to set up intensive farming systems and of an increased mechanization.

For this reason, certain land uses, such as vineyards, are more susceptible to erosion, which also leads to loss of soil organic matter. It is necessary to identify management strategies which allow to preserve and increase the level of organic matter in the European soils.

The correct management of organic fertilization, intended as the supply of organic matrices, such as compost, solid fraction of digestate and manure, could represent an opportunity to overcome this problem.

The variable rate technology application:

LIFE VITISOM project

In the viticultural sector, the precision farming technique is essential to direct the management decisions based on the specific information regarding the grapevine state. This represents the concept of “variable rate technology – VRT”, which allows to calibrate the supply of fertilizers based on the actual needs of the grapevine. For this reason, the application of this technology in the viticultural sector owns a highly innovative meaning. Nevertheless, this technology isn't today yet known for the organic fertilization in vineyard.

The project **LIFE VITISOM** proposes the **introduction of an innovative system for the distribution of organic fertilizers in vineyards, which allows to contrast the soil organic matter erosion and to improve the quality of soil, through the adoption of the VRT**. The project has a clear demonstrative character, aimed at the realization of 5 prototypes, adapted to specific pilot contexts and identified as representative of the vineyard variability on the European territory.





Objectives

- Implementation of the VRT to upgrade the vineyard organic fertilization distribution systems, an innovation for the viticultural sector.
- Promote a more sustainable approach to vineyard soil management: improvement, at local and European level, of the quality of vineyard soils in terms of soil structure, organic matter content and biodiversity.
- Contribute to the definition of a complete framework for vineyard soil and organic matter management and to the exchange of best practices in viticultural sector: the project allows to identify, through testing carried out in different pilot contexts, a complete framework of vineyard soil management, reproducible at EU level.



AfterLIFE prototype's utilization Plan

During the course of the project, the developed prototypes have been tested in winegrowing enterprises other than of the test sites involved in the VITISOM project.

This, together with the considerations that emerged during the tests and the comparison with the technicians of the partner companies, has allowed the reconfiguration, in some cases, of the use of the various prototypes originally developed for a specific wine-growing context.

After the end of the project, the five prototypes will be located as follow:

- ❖ **VRT 6:** the prototype (self-levelling wagon and MECS-WOOD sensor) will be used at the partner company Conti degli Azzoni, since the self-levelling proved to be effective for the counterslopes of the Marche region. The prototype is already in use.



- ❖ **VRT 7:** the prototype has been used at Guido Berlucchi partner company, since it is suitable to transit in narrow spacing vines. It will continue to be used at this company.

- ❖ **VRT 5:** the prototype has been developed for the plain conditions of Bosco del Merlo. It will be used at Guido Berlucchi company in the context of vineyards with a wider planting layout.





❖ **VRT3:** this prototype, originally developed for the vineyards located in the Marche region (Conti degli Azzoni), will be used in the context of the project LIFE ZEOWINE - LIFE17 ENV/IT/000427, in close synergy with VITISOM.



- ❖ **VRT4:** this prototype (wagon and MECS-WOOD sensor), originally designed and tested at Castelvevchi wine company, will be used at the Barone Pizzini wine company in Franciacorta region (Lombardy). This company represents one of the winegrowing enterprises, other than of the test sites, in which the prototype has been tested during the project.



The MECS-WOOD sensors associated to VRT 5 and VRT 3 will be employed, respectively, in:

1. FARESUBIO FEASR project (Programma di Sviluppo Rurale 2014-2020 MISURA 16 – “COOPERAZIONE” - SOTTOMISURA 16.1 - OPERAZIONE 16.1.01), of which Consorzio Franciacorta represents the coordinator. This project, for the content and the involved actors (University of Milan, Castello Bonomi and Guido Berlucchi), can be considered the natural continuation of the VITISOM project;
2. Dedicated to renting forms for applicative and experimental purposes.



AfterLIFE Eddy Covariance's utilization Plan

VITISOM provided essential funding to support the research team of the University of Padua in the maintenance of the experimental stations and to perform data processing and analysis, allowing the continuation of CO₂ flux monitoring started few years before the beginning of the project.

The experimental site Bosco del Merlo has been candidated to be part of the EU Strategic Research Infrastructure ICOS – Integrated Carbon Observation System. ICOS represents a network of stations around Europe measuring Greenhouse Gas emissions (GHG) in the atmosphere, oceans and ecosystems. The aim of ICOS is to provide long-term, high-quality and coordinated information to quantify and understand the GHG balance of Europe

research infrastructure, providing the only measurements of GHG on woody crops (vineyard and orchards) within the network. The planned time scale of ICOS measurements is in the order of several years/decades.

In order to keep the station active during the whole duration of ICOS, the team of the University of Padua will search additional funding through the application for further regional and European projects, as well as seeking collaborations with private companies (e.g. wine producer association).

Regarding the Eddy Covariance installed at Guido Berlucchi site, University of Padua is operating in order to get external support for continuing CO₂ flux monitoring. This represents a great opportunity to obtain important and unique results both for the scientific community and wine producers of the Franciacorta area.

The viticulture of the whole Franciacorta DOCG is organically managed and the collection of information on the carbon balance of a typical vineyard could be crucial to improve the environmental sustainability of an area, which aims at reducing the environmental impacts of viticulture.





AfterLIFE Communication Strategy

PARTNER	ACTIVIY AFTER-LIFE	RESOURCES
UNIMI	<ul style="list-style-type: none"> • <u>Dissemination activities</u> (at least 5 dissemination opportunities) • <u>Publication of technical articles</u> (at least 4 articles) • <u>Publication of scientific articles</u> (at least 1 article) • <u>Relationships with policy makers</u> (Ministry, Regions) • <u>Use of MECS-WOOD sensor</u> as part of the FARESUBIO project • <u>Continuation of soil quality investigations</u> through the FARESUBIO project 	<ul style="list-style-type: none"> • An additional expense of about 4000 euros is estimated for <u>dissemination activities</u> through own resources • For the <u>activities provided in the FARESUBIO EAFRD project</u> (Rural Development Program 2014-2020 MEASURE 16 - "COOPERATION" - UNDER MEASURE 16.1 - OPERATION 16.1.01) the overall budget foreseen for UNIMI is equal to 178,209.32 euros.
UNIPD	<ul style="list-style-type: none"> • <u>Publication of 1 scientific article</u> • <u>Extension of collection activities by Eddy Covariance</u> 	An expense of approximately 15,000 euros per year is estimated for each of the two stations. In three years, around € 90,000 must be allocated to ensure the operation and data collection from the two stations. External financing, it is proceeding to find the necessary funds.
CAS	<ul style="list-style-type: none"> • <u>Participation in exhibitions</u> (at least 1 per year) • <u>Demonstration events</u> (at least 2) • <u>Production of machines</u> built on the basis of prototypes developed by VITISOM LIFE on a commercial scale • <u>Prototype rental</u> for use in the context of the LIFE ZEOWINE project 	<p>The <u>dissemination activities</u> will be organized in the context of events already planned by the company (eg Fairs, Open Days).</p> <p>For the construction of the machines it is estimated costs of approximately 20,000 euros per machine (to be incurred against sales contracts)</p>
ITB	<ul style="list-style-type: none"> • <u>Website</u>. The project website will be regularly updated and accessible online at least 5 years after the end of the project (Il.7.1 Grant Agreement.) and will guarantee 1000 views / year. • <u>Social Network Page</u>. The VITISOM LIFE page will be active for 3 years after the end of the project, with publication, at least 1 post / month and at least 1000 views / year 	<ul style="list-style-type: none"> • <u>Maintenance of the website</u>: hosting costs 300Euro / year • <u>Dissemination of the publications</u>: 200 euro / year for 3 years • <u>Communication material distribution</u>: 200 euros / year for 3 years

	<ul style="list-style-type: none"> • <u>Dissemination of the publications.</u> The "Green Book" and "Manual" will be distributed during events, such as field visits, conferences, sector conferences to promote contamination between projects and interested actors. The total distribution of at least 30 copies / year is estimated. [200 euro / year for 3 years] • <u>Distribution of materials in digital format.</u> The communication materials will be available on pendrives and distributed during sector conferences / events / exhibitions. At least 30 pendrives distributed in 2 events / year [200 euros / year for 3 years]. 	
WEST	<ul style="list-style-type: none"> • <u>Dissemination activities</u> (at least 2) • <u>Publication of technical articles</u> (at least 1) • <u>Publication of scientific articles</u> (at least 1) 	A commitment for <u>dissemination activities</u> is estimated at around € 2,500 (from own resources)
BER	<ul style="list-style-type: none"> • <u>Dissemination activities</u> inside the company (at least 2) • <u>Use of the technology developed by VITISOM LIFE</u> • <u>Extension of soil quality investigations</u> through the FARESUBIO project 	<ul style="list-style-type: none"> • The <u>dissemination activities</u> will be organized in the context of events already planned by the company (eg Festival Franciacorta, Vinitaly). • <u>For the purchase of the prototypes</u> of the project, an expenditure of 17000 is expected (from own resources) • For the <u>activities foreseen by the FARESUBIO EAFRD</u> project (Rural Development Program 2014-2020 MEASURA 16 - "COOPERATION" - SOTTOMISURA 16.1 - OPERATION 16.1.01) the overall budget for UNIMI is equal to 18000 euros
CBON	<ul style="list-style-type: none"> • <u>Dissemination activities</u> inside the company (at least 2) • <u>Extension of soil quality investigations</u> through the FARESUBIO project 	<ul style="list-style-type: none"> • The <u>dissemination activities</u> will be organized in the context of events already planned by the company (eg Festival Franciacorta, Vinitaly). • For the <u>activities foreseen by the FARESUBIO EAFRD</u> project (Rural Development Program 2014-2020 MEASURA 16 - "COOPERATION" - SOTTOMISURA 16.1 - OPERATION 16.1.01) the overall budget for UNIMI is equal to 9000 euro
CDA	<ul style="list-style-type: none"> • <u>Dissemination activities</u> inside the company (at least 2) 	<ul style="list-style-type: none"> • The <u>dissemination activities</u> will be organized in the context of events already planned by the

	<ul style="list-style-type: none"> • <u>Use of the technology developed by VITISOM LIFE</u> in the company context 	company (eg Festival Franciacorta, Vinitaly). •For the <u>purchase of the prototypes</u> of the project, an expenditure of 15000 (from own resources is expected)
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AfterLIFE European Replicability

European viticulture is composed by very different realities from one country to another, whether in terms of vineyard dimension, type of soil, produced wines or oenological practices linked to the climatic characteristics of each region.

LIFE VITISOM project goes beyond the vineyard variability, providing a solution for their sustainable management.

The project proposes an innovative application of the variable rate technology for the organic fertilization of vineyards, testing the developed prototypes in different Italian viticultural contexts, representatives of the variability of the European vineyards. For instance, the application of the VRT can be adopted in all the European viticultural areas and, at the same time, could represent a useful contribution to the sustainable management of the biological vineyards.

To demonstrate the effective reproducibility of the method, a map of the Europe is reported below.

The main European viticultural regions are identified through different colours (from the darkest to the lighter green), which represent the Vineyard Type for a value major than 60%: plain, terrace, slope, contour plowing and narrow planting. For accuracy, it has to be specified that the areas with extreme conditions (very extreme slopes) are not prone to be treated with the VRT technology and, for this reason, are not taken in account into the coloured regions.

In each region, the typology of prototype which could be adopted is reported, according to the percentage of utilization (reported in different colours: violet for a % of utilization between 1% and 29%; orange violet for a % of utilization between 30% and 60%; light blue violet for a % of utilization between 61% and 100%).

