

LIFE15 CCM/ES/000032



LIFE  
SARMIENTO

# FIRST REPORT ON DEMONSTRATION ACTIVITIES

First report on demonstration activities in vine yards, including data about quantity of substrate delivered and area where it has been applied, time (total, per ha, per farm) needed and first feedback

*Demonstration of an innovative solution to reduce GHG emissions  
in vineyards while improves the soil in arid areas*

ACTION C.2: Demonstration of the substrate use



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**Deliverable 9; name:** *First report on demonstration activities in vineyards*

**Beneficiary responsible:** MICROGAIA

**Action C2:** *Demonstration of the use of substrates*

From month 5 – month 51

- **First report on demonstration activities in vine yards**

Name of the Deliverable	Number of associated action	Deadline
First report on demonstration activities in vine yards, including data about quantity of substrate delivered and area where it has been applied, time (total, per ha, per farm) needed and first feed	C2	31/05/2017

## 1. Assay plots

The efficiency tests of the compost produced will be analysed in vineyard plots with an extension of more than 2 hectares. It will be set up four plots to compost application and four plots as control (without compost application). Results obtained from these trials will be used to compare the physical-chemical and biological properties of the soil as well as the quantity and quality of harvest.

### 1.1 Selection of plots

It was selected one plot for each different agroclimatic area that making up Bullas DOP. For our purpose it will be set up four plots.

### 1.2 Characterization

The soil of test plots were characterized through an exhaustive sampling detailed in Deliverable 10. This deliverable includes the average data corresponding to the analysis performed for each plot from 2017 assays, to which was added ALMOST

compost, and to which in the following years it will be added SARMIENTO compost.

## 2. First demonstration with ALMOST compost.

During the first year ALMOST compost has been added to one of the test plots that will be integrated during year 2018 to the rest of selected test plots. This compost, from the previous Project was produced with the same composting protocol applied in Life Sarmiento with the objective to get enough effectiveness data for as many years as possible. Since January-February 2018 it will be added SARMIENTO compost to the three remaining plots as well as urban gardens and nurseries during three consecutive years.

It was characterized the soil of the plot as well as the added compost. After harvest, it was analysed, respect controls plots, the physicochemical characteristics of the soil in addition to the data corresponding to production and quality of grape. Analysis results are shown below.

Characterization of soil used in the experiment. The table shows the physicochemical characteristics at the beginning of the experiment (May 2017).

Parameter	Value
pH (H <sub>2</sub> O)	8.46
EC (uS cm <sup>-1</sup> ) <sup>a</sup>	141
CaCO <sub>3</sub> (%)	29.8
CaCO <sub>3</sub> active (%)	15.3
Oxidizable organic C (g kg <sup>-1</sup> )	7.4
Total Kjeldahl N (g kg <sup>-1</sup> )	0.76
N-NO <sub>3</sub> <sup>-</sup> (mg kg <sup>-1</sup> )	15
<i>Soil texture</i>	
Sand (%)	56.0
Silt (%)	9.50
Clay (%)	34.5
<i>Plant available nutrients<sup>b</sup></i>	
K (g kg <sup>-1</sup> )	0.54
P (mg kg <sup>-1</sup> )	79
Ca (g kg <sup>-1</sup> )	4.10
Mg (g kg <sup>-1</sup> )	0.34
Na (g kg <sup>-1</sup> )	0.16
Fe (mg kg <sup>-1</sup> )	5.31



Cu (mg kg <sup>-1</sup> )	0.71
Mn (mg kg <sup>-1</sup> )	2.60
Zn (mg kg <sup>-1</sup> )	0.74

<sup>a</sup>EC, electrical conductivity.

<sup>b</sup>Ammonium acetate extract (Na, K, Ca, Mg);  
Olsen method (P); DTPA extract (Fe, Cu, Mn,  
Zn).

Characterization of compost used in the experiment. The table shows the physicochemical characteristics of ALMOST compost.

PHYSICAL CHARACTERISTICS		CHEMICAL CHARACTERISTICS	
	Range		Range
Density (g/cm <sup>3</sup> )	1,68 - 1,96	pH	7 ± 1
Bulk density (g/cm <sup>3</sup> )	0,18 - 0,28	Conductivity (dS/m)	< 1
Porosity (%)	85 - 89	Organic matter (%)	45 - 60
Water holding capacity (%)	329 - 644	N (%)	2,20 - 2,60
Volumetric shrinkage (%)	8,74 - 23,39	P (%)	0,5 - 1,1
		K (%)	1,20 - 1,60

MICROBIOLOGICAL CHARACTERISTICS	
	Range
Salmonella	Absence in 25 g
E. coli	< 1000 MPN /g

Heavy metals:  
Classified as Type A in the Spanish regulations  
Free from weed seeds

The next tables contain the comparison of physicochemical characteristics and nutrient status of soil at the beginning of the experiment (May 2017) and at the end of experiment (September 2017) after harvest.

Physicochemical characteristics and nutrient status of the soil r at the beginning and at the end of primer anual crop (dry-weight basis)

Treatments	pH		Electrical conductivity ( $\mu\text{S cm}^{-1}$ )		Oxidizable organic C (%)	
	Beginning	End	Beginning	End	Beginning	End
Control	8.46 b	8.23 a	141 a	172 a	0.74 a	0.79 a
Compost Almost	8.29 ab	8.27 a	302 b	194 ab	0.91 b	0.95 b

Treatments	Respiration ( $\text{mg CO}_2\text{-C kg}^{-1}$ dry soil $\text{day}^{-1}$ )		Biomass C ( $\text{mg C kg}^{-1}$ dry soil $^{-1}$ )		Water-soluble C ( $\text{mg C kg}^{-1}$ dry soil $^{-1}$ )	
	Beginning	End	Beginning	End	Beginning	End
Control	12.9 c	26.0 b	29 b	41 b	156.86 ab	30.89 b
Compost Almost	16.9 e	29.4 bc	25 ab	28 a	206.93 c	41.07 c

Physicochemical characteristics and nutrient status of the soil at the beginning and at the end of primer anual crop  
(dry-weight basis)

Treatments	NO <sub>3</sub> <sup>-</sup> -N (mg kg <sup>-1</sup> )		Total Kjeldahl N (g kg <sup>-1</sup> )		Available P (mg kg <sup>-1</sup> )	
	Beginning	End	Beginning	End	Beginning	End
Control	15 a	15 ab	0.76 a	0.85 a	79 a	53 ab
Compost Almost	26 b	16 ab	0.89 ab	0.84 a	93 b	51 a

Treatments	Available Na (g kg <sup>-1</sup> )		Available K (g kg <sup>-1</sup> )		Available Fe (mg kg <sup>-1</sup> )	
	Beginning	End	Beginning	End	Beginning	End
Control	0.16 a	0.20 a	0.54 a	0.60 a	5.31 a	1.65 a
Compost Almost	0.27 b	0.28 b	0.74 b	0.73 b	4.78 a	2.24 b



The next table contains the comparison of important quality parameters of grape such as Baume grade, pH or total acidity as well as the comparison of yield production from the beginning of the experiment (May 2017) to the end of experiment (September 2017) after first harvest.

Grape production and quality parameters

Parameter	No. (cluster/vine)	Grape yield (kg grape/vine)	Average weight (g/cluster)	Baume grade (°Be)	Grape pH	Total acidity (g tartaric acid ml <sup>-1</sup> )	IPT	Total anthocyanins (mg l <sup>-1</sup> )	Extractable anthocyanins (mg l <sup>-1</sup> )	MCI (%)
Control	24	1.44	61	13.0	3.24	3.76	32.6	1049	435	58.5
Compost Almost	31	2.11	66	12.7	3.22	4.10	29.6	1042	376	63.9

### Conclusion of first year experiments:

- The increase of organic carbon oxidisable and soluble in water, which points out to an improvement of carbon sequestration in soil.
- The increasing of respiration rate which indicates an increment of total microbial community.
- N y P got increase just after compost application but they got decreasing in time until reaching the same levels of the beginning.
- K and Fe got increase at the end of experiment but not at the just after compost application.
- It was detected an increasing of the number of clusters in addition to the total weight of whole production.
- The improvement of the parameters balance of the ripe fruit.

## Annex

### *Plan de muestreo*

#### OBJETIVO:

Muestreo previo a la incorporación de enmienda orgánica en suelos en parcelas incluidas en el plan de demostración del uso del compost elaborado a partir de restos de poda de vid elaborado en proyecto anterior –ALMOST Project.

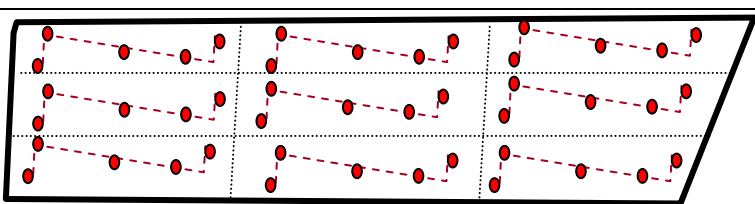
El objetivo principal es el establecimiento de una base de datos primarios que sirvan de base y permitan el análisis de la mejora sustancial de las propiedades del suelo mediante la adición consecutiva de enmiendas orgánicas provenientes del compostaje de los restos de poda que previamente se han obtenido de dichas parcelas.

#### RESPONSABLES

Muestreo: Julio Valero (MB)  
Sabina Romero (MB)  
Análisis: M<sup>a</sup> José Inglés (MB)  
Laboratorio externo

#### DISEÑO EXPERIMENTAL

Por cada parcela se tomarán 9 muestras compuestas de 5 sub-muestras cada una. Para ello cada parcela se divide en 9 segmentos y, para cada uno de ellos, se tomarán 5 muestras de suelo siguiendo un sistema zig-zag de manera que sean lo más representativos de cada muestra, aproximadamente siguiendo el siguiente esquema:

Esquema muestreo	Símbolo	Leyenda
	—	Límite parcela
	.....	Línea divisoria sub-parcelas
	- - - -	Línea seguimiento muestreo
	●	Punto de sub-muestra

Las muestras serán tomadas desechando la parte superficial, de unos 5 cm, tomando muestra real de una profundidad comprendida entre los 10-15 cm siguientes. Estas sub-muestras se tomarán en zonas cercanas a las raíces de las cepas, a una distancia aproximada de unos 25 cm

del tronco. La sub-muestra debe contener al menos 1 L de tierra, desechando piedras y posibles restos vegetales en superficie, así como evitando una humedad excesiva del suelo.

Una vez tomadas las 5 sub-muestras éstas se homogeneizarán en campo en un recipiente adecuado, de manera que se obtendrá una muestra final correspondiente a 1 segmento de la parcela, que deberá contener al menos 0,5L de muestra en bolsas herméticas para evitar pérdidas o posibles contaminaciones.

Las muestras serán debidamente etiquetadas con los siguientes datos in situ:

- Parcela
- Fecha
- Segmento

Las muestras serán conservadas a ser posible en refrigeración hasta su envío para análisis.

## LOCALIZACIÓN PARCELAS

### PARCELA 1

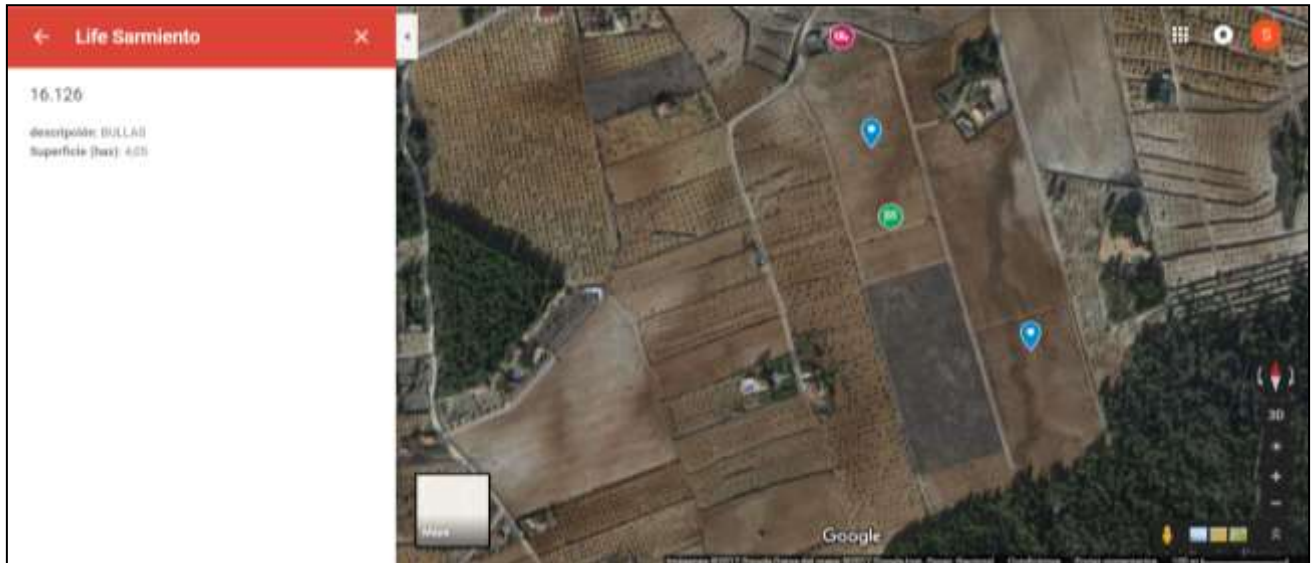
Población:	Mula
Polígono	172
Parcela	64
Superficie (Ha)	0,91
Localización GPS	37.998172, -1.655717
Distancia hasta Bodega (km)	7,5



### PARCELA 2



Población:	Bullas
Polígono	16
Parcela	126
Superficie (Ha)	4,05
Localización GPS	38.015971, -1.698925
Distancia hasta Bodega (km)	6,4



### PARCELA 3

Población:	Cehegín
Polígono	67
Parcela	67
Superficie (Ha)	2,5
Localización GPS	38.003969, -1.748574
Distancia hasta Bodega (km)	11,4



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← Life Sarmiento ×

67.67

descripcion: CD-EGN  
Superficie (has): 2.50

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