

# LIVINGSOIILL

## Healthy Soil to Permanent Crops Living Labs

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DE TRÁS-OS-MONTES  
E ALTO DOURO



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European Union



# Healthy Soil to Permanent Crops Living Labs

**Soil Mission:** Co-creating solutions for soil health in Living Labs  
**Project 101157502**

01/06/2024 – 30/11/2028 (54 months)

# Why Living Labs on Permanent Crops soil challenges?

**Grapevines, olives and fruit crops (apples, chestnut and hazelnuts)** are some of the most economic relevant **Permanent Crops (PC)** in the EU, which are facing important challenges related to **soil health issues**, due to **production practices**, but exacerbated by **climate change**.



## The PC selected are of utmost importance for:

- Promoting **rural economies' competitiveness** and the **vitality** of many **European rural areas**.
- Promoting **healthy food dietary patterns and lifestyles**, by supplying the consumption of high-quality products defined by local origin.
- **Shaping cherished landscapes**, often acknowledged as world cultural heritage, a key for thriving tourism in rural areas.



Goal: co-creating, co-implementing and co-testing solutions to reduce erosion, improve soil structure, reduce the impacts of the intensive use of fertilizers and pesticides, increase water storage, enhance soil biodiversity, and the overall resilience of soil.





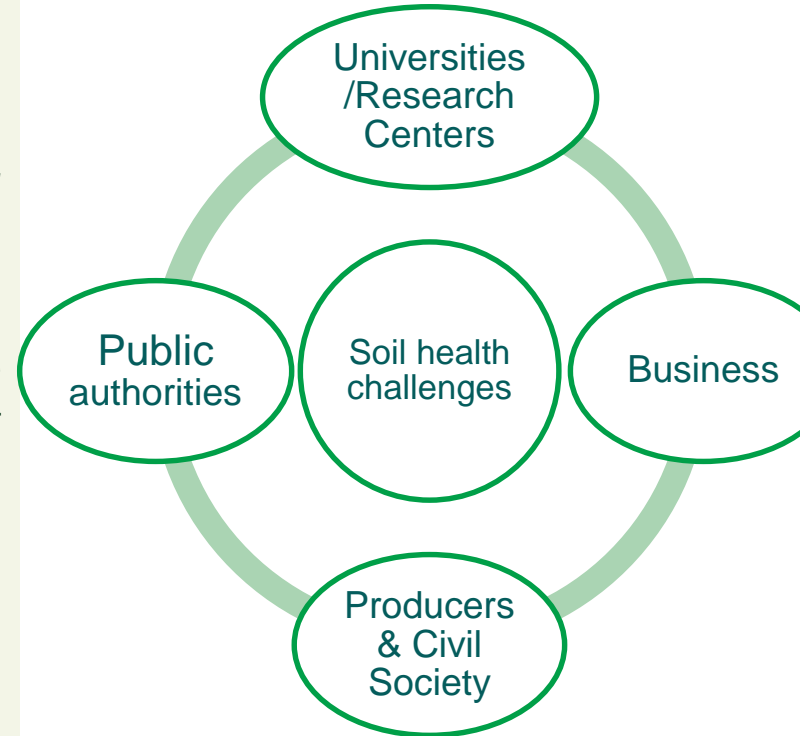
## Objectives

- To establish a **network of 5 Living Labs** focused on **permanent crops** with economic, social and cultural importance in the EU (**vineyards, olive groves, chestnuts, hazelnuts and apple orchards**).
- To **co-create, co-implement and co-test innovative solutions** that foster conservation/restoration of soil health

To set up at least **50 experimental sites and 10 lighthouses**, with active participation of more than **2000** local actors.

# Rationale for cooperation:

- Common soil health issues identified on PC
- **6 EU Universities** with: i) a **high scientific reputation in soil sciences and soil threats** and, on PC and production practices demonstrated by their participation in several European networks; ii) an **extensive experience of collaboration with local producers, and interaction with public administration bodies.**
- **Existing strong networks of collaboration in the proposed LL**, whose experience can be shared – INTERMEDIATE LEVEL OF DEVELOPMENT
- Partners with a **high potential for technological innovation** (e.g. IFV) in the agri-food sector with a high transference capability.
- **Partners with experience on social sciences** with capability to design strategies for knowledge and practices transference.



# 5 Living Labs location

## Project Coordinator:

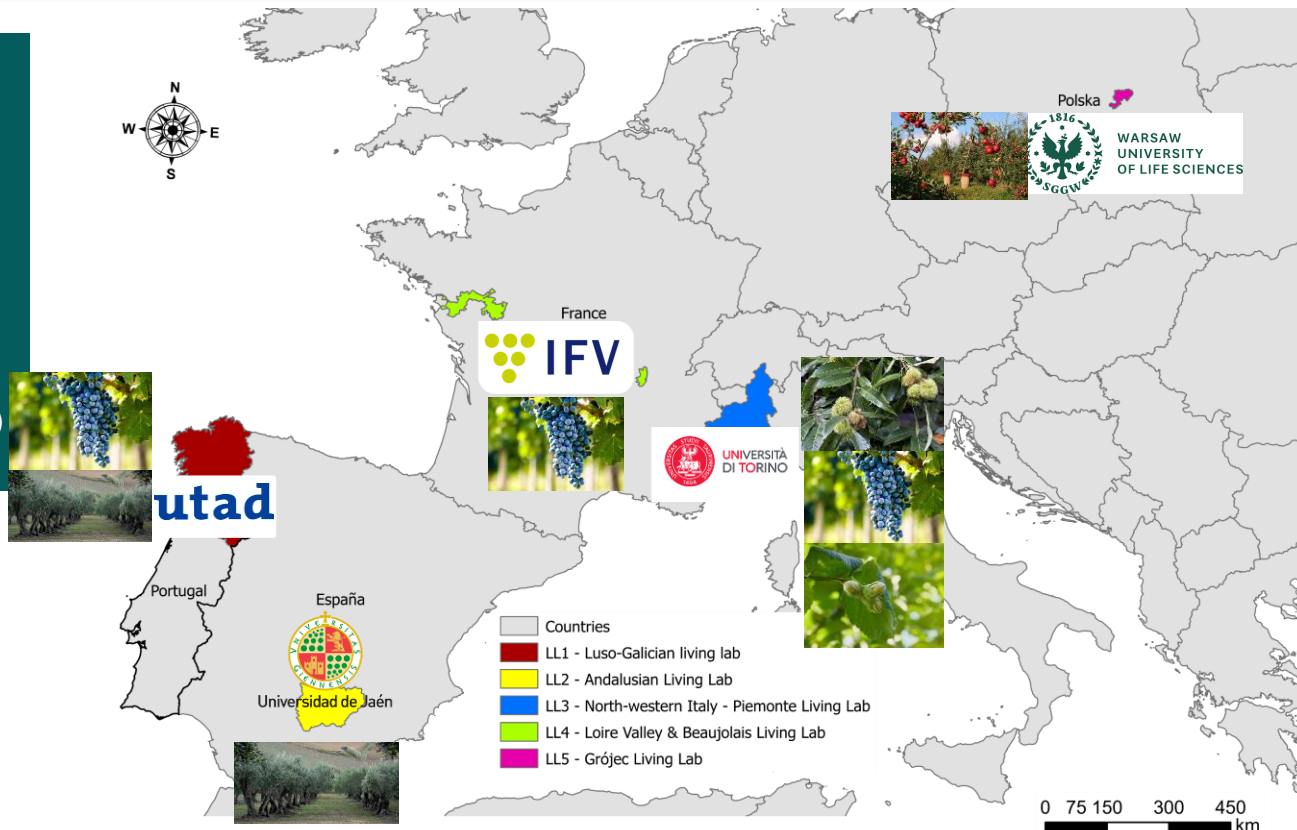
Cristina Carlos (UTAD, Portugal)

## Financial Manager:

Lígia Pinto (UTAD, Portugal)

## LL coordinators:

- UTAD (Cristina Carlos)
- Univ. of Jaen (Juan Jurado)
- IFV (David Lafond)
- Univ. of Turin (Eleonora Bonifácio)
- Warsaw Univ. (Jozef Chojnicki)



# LivingSoiLL consortium – 5 living Labs - 42 partners + 8 associated partners

Luso-Galician LL



Universidade de Vigo



Andalusian LL



Universidad de Jaén



NW Italy- Piemonte LL



UNIVERSITÀ DI TORINO



Beaujolais & Loire Valley LL



Grojec LL



WARSAW UNIVERSITY OF LIFE SCIENCES



Associated partners





# 5 Living Labs

Luso-galician LL  
**UTAD**  
(Vineyards, Olives)

Andalusian LL  
**UJAEN**  
(Olives)

NW Italian  
Piemonte LL  
**UNITO**  
(Vineyards, Chestnuts,  
Hazelnuts)

Grojec LL  
**WULS**  
(apple orchards)

Beaujolais &  
Loire Valley LL  
**IFV**  
(Vineyards)



**Unique opportunity for exchanging and interaction between the actors of the 5 living Labs with similar soil challenges**

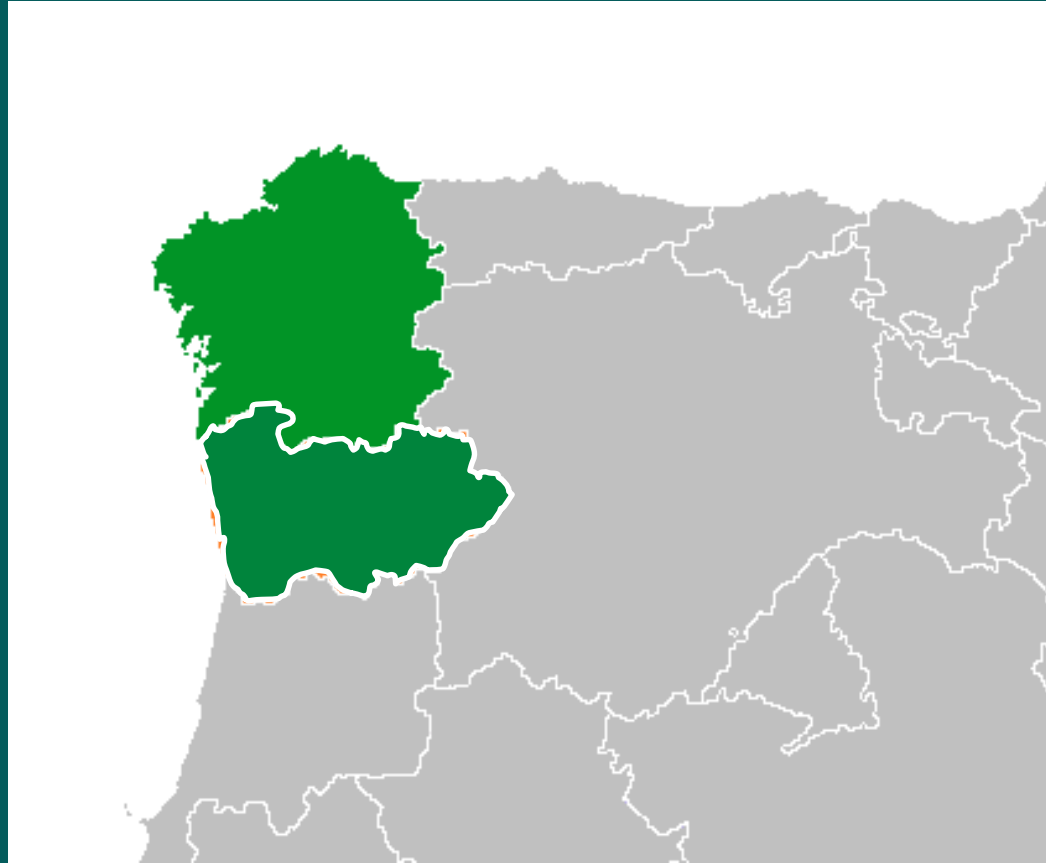
# Soil health challenges and Mission Soil objectives adressed



Mission's Specific Objectives	Luso-Galician LL	Andalusian LL	North-western Italy - Piemonte LL	Loire Valley & Beaujolais LL	Grójec LL
	Vines/Olives	Olives	Vines/ Chestnuts/ Hazelnuts	Vines	Apples
1. Reduce desertification					
2. Conserve soil organic carbon stocks					
3. Stop soil sealing and increase re-use of urban soils					
4. Reduce soil pollution and enhance restoration	+	+			+
5. Prevent erosion	+	+	+	+	
6. Improve soil structure to enhance soil biodiversity	+	+		+	
7. Reduce the EU global footprint on soils					
8. Improve soil literacy in society	+	+	+	+	+

# Luso-Galician Living Lab

two neighbouring regions (North of Portugal and Galicia), with a high potential for cooperation and co-creation of common synergies across several business sectors



# Membership

- The consortium comprises experienced partners with **inter and transdisciplinary research strategies and practices:**
- **3 Research institutions** (UTAD, UPORTO and UVIGO)
- **farmers/companies**  
7 from the wine sector and  
4 from the olive sector
- **2 farmer's association:**  
**wine-** ADVID; **olives:** APPITAD



**20 Experimental Sites (EXPS)** will be set up , with active participation of local actors and 3 potential lighthouses were identified

# Luso-galician Living Lab

U. PORTO

Universidade de Vigo

utad

BODEGAS  
TERRAS GAUDA



ACUSHLA  
organic olive oil



SOGRAPE



CASA DE SANTO  
AMARO



QUINTA VALE DO CONDE



Horizontal Partner



FERTIPRADO

Horizontal Partner



# Luso galician LL (North PT/ Galicia - SP)

taking advantages of previous synergies in experimenting innovative techniques of soil conservation

## Vineyards – Douro Demarcated Region



## Olive groves in Trás-os Montes region



## Vineyards in Galicia



2 crops sharing similar soil problems

**The Douro Demarcated Region**  
(Douro and Port wine DOC) includes the **Alto Douro Vinhateiro, area classified by UNESCO** since 2001 as a World Heritage Site, in the category of cultural landscape



**Douro Valley  
vineyards**





**Galician  
vineyards**





**Trás-os-Montes  
region**



Erosion as a main threat in the Luso galician LL

Losses of OM, nutrients and small water holding capacity

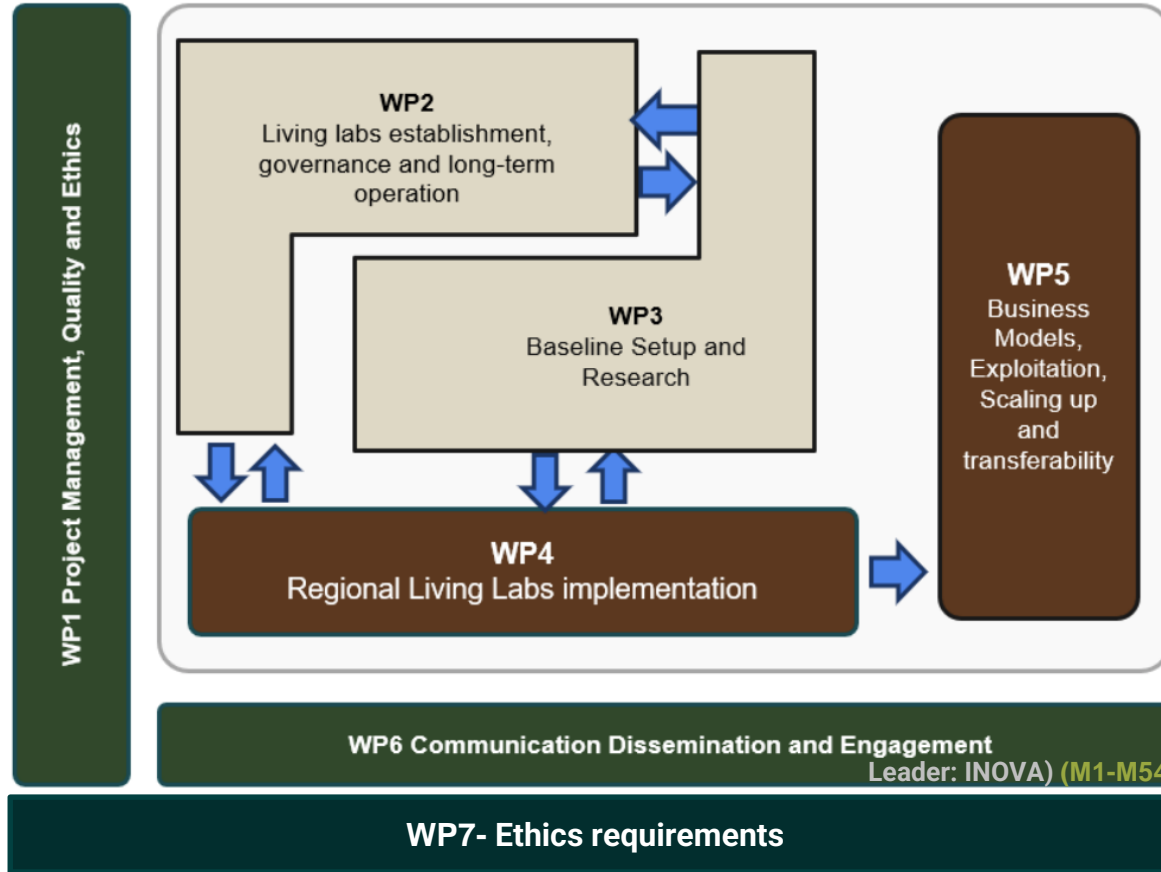




# Work plan



# Project structure



- **7 Work Packages (WPs)**, each playing a pivotal role in achieving our objectives



## WP4

“LL Luso-galician will implement soil monitoring frameworks aimed at to **monitoring the impacts of the implementation of innovative soil management practices on soil indicators/descriptors** at each EXPS.

Additionally, to **assess the impact of practices implemented in crops**, some variables will also be collected (impact on physiology, yield and quality of production) and ecosystem services will also be assessed in a collaborative way”

Living Lab		Luso-Galician LL		Andalusian LL	North-western Italy - Piemonte LL	Loire Valley & Beaujolais LL	Grójec LL	TOTAL
Partner responsible for the analysis		UTAD	UVIGO	UJAEN	UNITO	UPORTO	WULS	
Soil Analyses	Metagenomics	504	216	540	360	360	360	2340
	General physical and chemical analysis + Nutrients*	504	216	540	360	360	360	2340
	Metals	336	144	360	240	240	240	1560
	Total Organic Carbon	504	216	540	360	360	360	2340
	Pesticides	112	48	120	80	80	80	520
	Erosion	**						
<b>TOTAL</b>		<b>2800</b>		<b>2100</b>	<b>1400</b>	<b>1400</b>	<b>1400</b>	<b>9100</b>

\* By physical-chemical and nutrients analysis we include all the soil descriptors described on the Soil Monitoring Law, except metagenomics, pesticides and metals. \*\* Erosion analysis will vary depending on site specific conditions at each EXPS. This analysis in all the LL will be supported by UNITO and UPORTO which have the required expertise.

This set of analysis will include a minimum of twelve (12) samples collected, on each EXPS in each LL, to analyze the parameter's **metagenomics**, **general physical and chemical analysis + nutrients**, **metals** and **total organic carbon**. It also includes a minimum of four (4) samples collected, on each EXPS in each LL, to analyze **pesticides**. The number of samples/points for the characterization of **erosion** parameters will depend on the previous characterization of each EXPS.

Analysis will be performed during 3 sampling periods (3 years) for all parameters, apart from pesticides and metals that will be performed only twice, in the first and third year, as no great annual variations in the soil are expected. The plan foresees the repetition of analysis and additional that might be required for EXPS to validate the implemented co-created solutions within WP4, in terms of agronomic performance. To undertake the necessary analysis, partners foresee the acquisition of technical and scientific equipment as presented in Table 1.1b.

# Innovative practices will be studied in a co-creation and collaborative process

- In the selected EXPS **innovative practices** related to soil management **will be identified** (meetings with focus group) and potentially some of the following will be implemented :
  - **testing different amendments** (on-farm composted residues, **vermicompost**, zeolite, biochar, biofertilizers),
  - **testing different cover crops** (using autochthonous and water-parsimonious species)
  - **testing different cover management** (rolled, tilled, mowed)
  - Testing the **use of mulching** or **reduced tillage**
- EXPS conducted in **organic/integrated production** will be chosen to compare its impacts on **soil health parameters**





# Proposal of activities to develop at each LL

Living Lab	Experimental sites		Partners		Ongoing or planned soil health-related work
	Identified	Target	Identified	Target	
LL1   Luso-Galician	20	20	13	>15	<ul style="list-style-type: none"> <li>a) cover crops (using autochthonous and water-parsimonious species; mulching and reduced tillage)</li> <li>b) cover crops terminated with a roller</li> <li>c) use of amendments (on-farm composted residues, vermicompost, zeolite, biochar, biofertilizers)</li> </ul>
LL2   Andalusian	15	15	7	>15	a) soil erosion, soil pollution, and water scarcity. The experimental solutions involve the use of organic matter, compost, plant cover, and biochar hydrofilters. In addition, we are monitoring changes in soil health using remote sensing sensors. All experimental sites are related with Olive trees use of organic matter, compost, plant cover, and biochar hydrofilters
LL3   North-western Italy - Piemonte	6	10	6	>10	<ul style="list-style-type: none"> <li>a) soil erosion (vineyard),</li> <li>b) chestnut (litter management, organic matter and fertility conservation, composting).</li> </ul>
LL4   Loire Valley & Beaujolais	0	10	3	>10	<ul style="list-style-type: none"> <li>a) cover crops with low water needs</li> <li>b) use of mulches, biochar or biobased woven groundcover</li> <li>c) sustainable management of organic matter</li> </ul>
LL5   Grójec	1	10	4	>10	<ul style="list-style-type: none"> <li>a) testing of different floor management systems in apple growing</li> <li>b) testing mulching with wide range of organic litter including agricultural waste and its effect on soil quality and fertility</li> </ul>

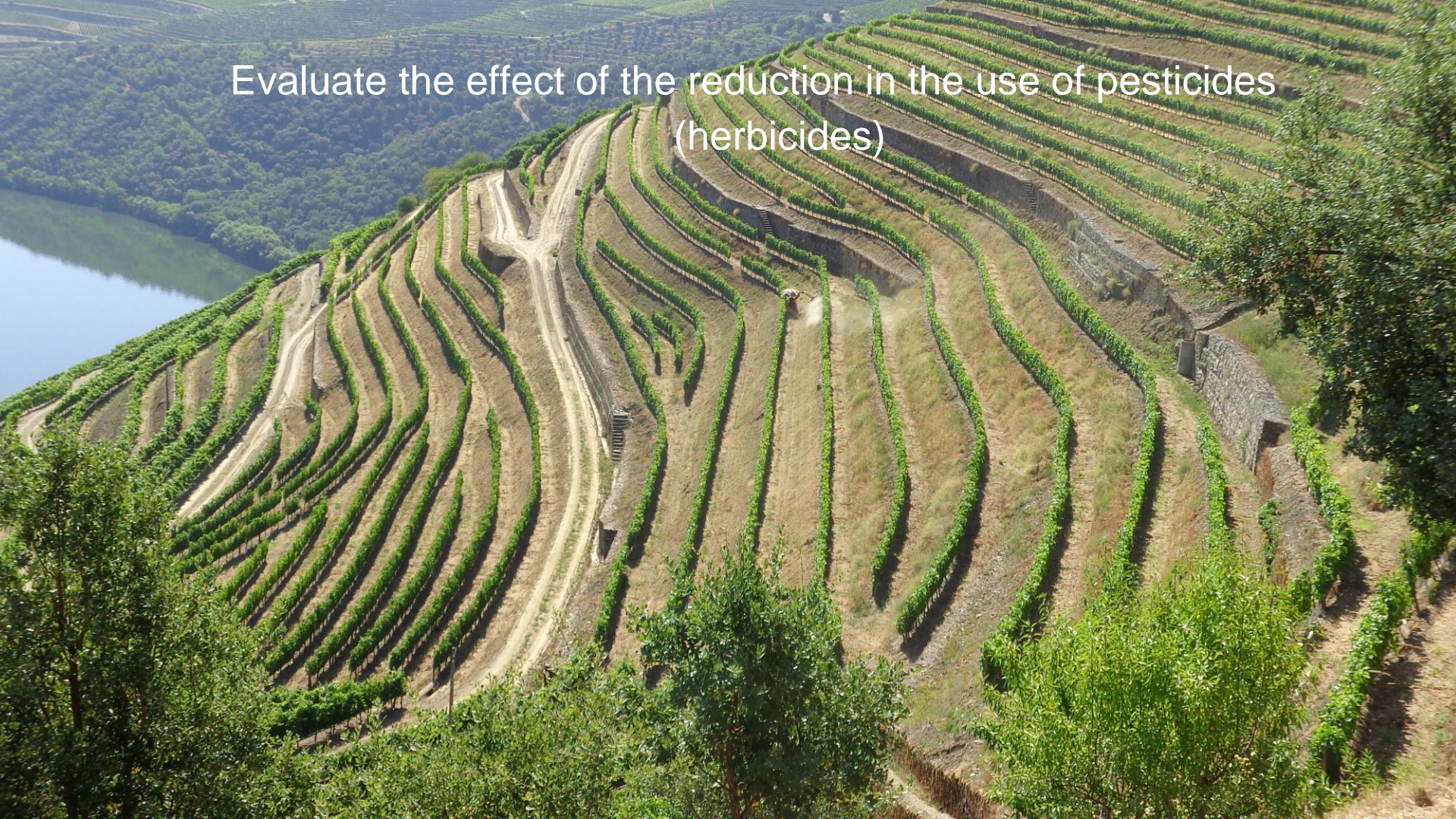


**Innovative practices under implementation will be studied**



**The use of cover crops is increasing** in both olive orchards and vineyards, but growers are still afraid that certain types of cover crops may compete with the main crop for nutrients and water during some stages of the growing season.

Evaluate the effect of the reduction in the use of pesticides  
(herbicides)





# Impact of different cover crops (spontaneous or sown species)?





**Impact of different composting**



# 1 living Lab

Luso-Galician

## 2 permanent crops

(vineyards, olive groves)

## 20 experimental sites

14 vineyards, 6 olive groves

## 3 potential lighthouses

2 in vineyards farm, 1 in olive groves farm

# Final Goals to set up...

## 5 living Labs

Luso-Galician (PT/ES), Andalusian (ES), NW  
Italian Piemonte (IT), Loire Valley &  
Beaujolais (FR), Grójec (PL)

## 5 permanent crops

(vineyards, olive groves, chestnuts,  
hazelnuts and apple orchards)

## 50 experimental sites

## 10 lighthouses





# Challenges and Recommendations for future calls

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- The quadruple helix framework poses significant challenges for project managers in terms of coordination and collaboration.
- LL with a high geographical extension causes a funding imbalance, which is not well seen and understood.
- Co-creation process is not well understood and difficult to implement due to budget justification requirements
- The negotiations after project approval can be highly demanding.
- ✓ The quadruple helix framework should be considered as a guiding principle for the proposal. Portugal is per sure a good example in what regards the link between academy, industry, and the primary sector. The number of partners from the sector was one of the reasons of success of this proposal.
- ✓ EU is expected to limit the geographical dispersion of the Living Labs.
- ✓ Take into account as much as possible funding balance between LL.
- ✓ In what regards soil monitoring frameworks, provide as much details as possible in terms of number of demonstration sites (DS), their extension, number of samples to be collected, indicators to be evaluated and corresponding protocols. This information must be clearly reflected in the justifications of the budget.

# Thanks!

**Does anyone have any  
questions?**

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UTAD / CITAB

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