



EUROPEAN UNION

# EUROPEAN MISSION SOIL WEEK

## Breakout session 2 - Soil health for food

21-23 November 2023

Press Room – Building D



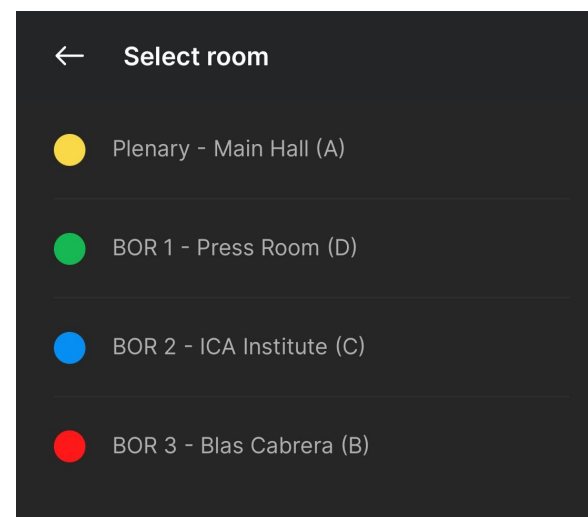
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#MissionSoilWeek #MissionSoil #EUMissions

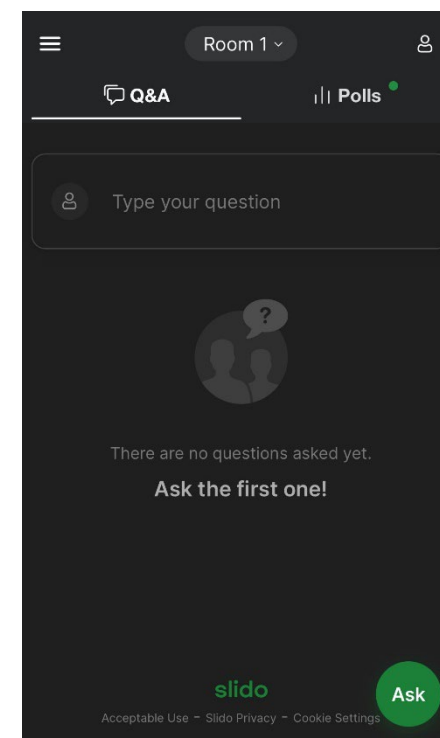


## Housekeeping rules

- **WIFI**
  - Network : EMSW
  - Password : np9dpL9Y\$8CS7v%
- **Questions**
  - Go to [www.sli.do](http://www.sli.do) and enter event code **#ESMW** (or scan the QR code)
  - Select the 'room' of the session
  - Submit your questions



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# Moderators

# EUROPEAN MISSION SOIL WEEK



## Giulia Meloni

Policy Officer

*European Commission – DG Research and Innovation*

*Mission Soil Secretariat*



## Giuseppe Pellegrino

Policy Officer

*European Commission – DG Research and Innovation*

*Mission Soil Secretariat*

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## Our speakers – 1<sup>st</sup> part



**Jose Manuel González**

Spanish Delegate to  
Horizon Europe Cluster 6

*Centre for the Development of  
Industrial Technology-- CDTI*



**Antonella Autino**

Programme coordinator

*Partnership on Research and Innovation in the  
Mediterranean Area – PRIMA*



**Pandi Zdruli**

Senior Research Scientist and  
Mission Soil Board member

*CIHEAM--International Centre  
for Advanced Mediterranean  
Agronomic Studies, Bari*



**Alfred Grand**

Farmer

*GRAND FARM*

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## Our speakers – 2<sup>nd</sup> part

# EUROPEAN MISSION SOIL WEEK



**Antonio José Manzaneda**

Professor

*Universidad de Jaén*



**Ansa Palojärvi**

Senior Scientist, DeliSoil project coordinator

*Natural Resources Institute Finland (LUKE)*



**Sara Daniotti**

Project Manager, Bin2Bean project coordinator

*Consorzio Italbiotec*

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**slido**



**How can the Mission soil support the transition towards sustainable and inclusive food systems ?**

① Start presenting to display the poll results on this slide.



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**A good deal for soils is a good deal for  
sustainable, healthy and inclusive food systems**

**Giulia Meloni**

Policy Officer & Mission Soil Secretariat  
DG Research and Innovation  
European Commission

21 November 2023



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# HORIZON EUROPE

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## THE EU RESEARCH & INNOVATION PROGRAMME

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2021 – 2027

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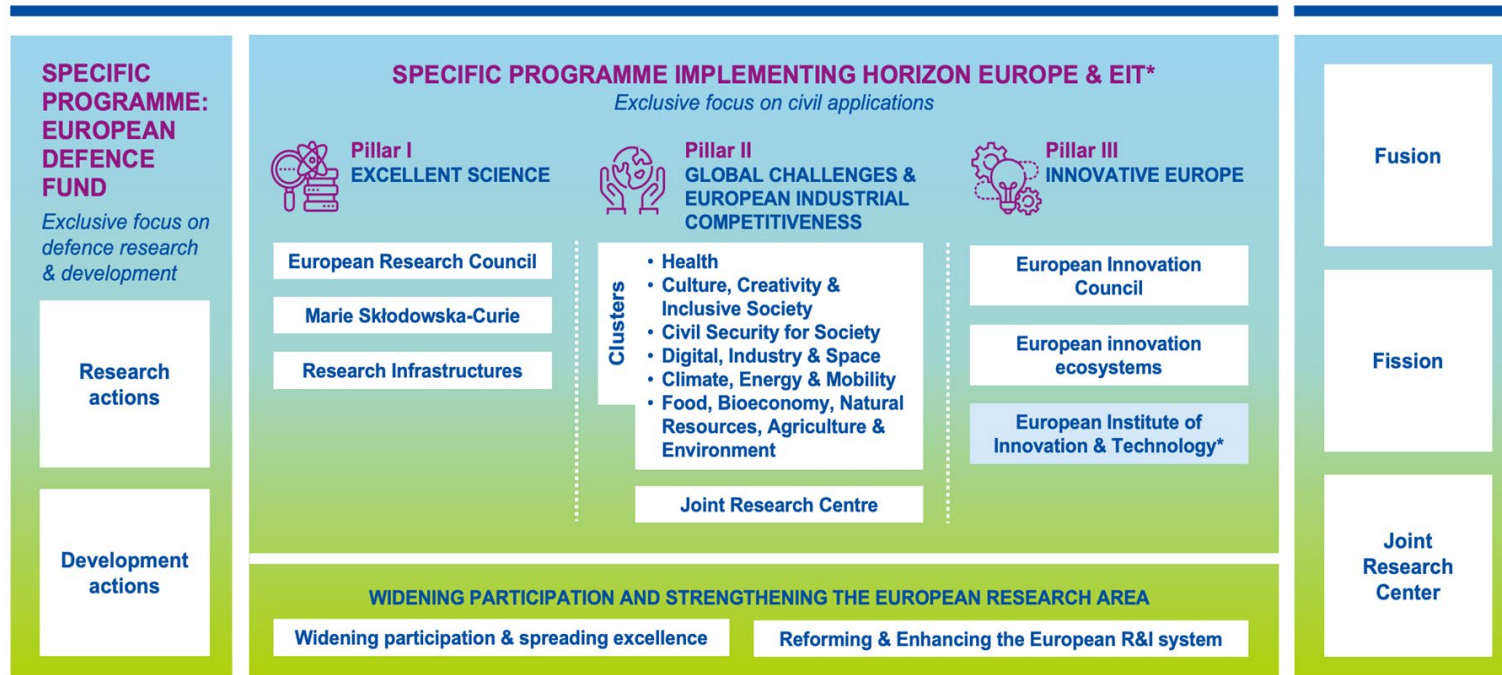






HORIZON EUROPE

EURATOM



\* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme



## 49 Horizon Europe partnerships to drive green and digital transitions

CLUSTER 1: Health	CLUSTER 4: Digital, Industry & Space	CLUSTER 5: Climate, Energy & Mobility	CLUSTER 6: Food, Bioeconomy, Agriculture,...
Innovative Health Initiative	Key Digital Technologies	Clean Hydrogen	Circular Bio-based Europe
Global Health Partnership	Smart Networks & Services	Clean Aviation	Rescuing Biodiversity to Safeguard Life on Earth
Transforming Health Care Systems	High Performance Computing	Single European Sky ATM Research 3	Climate Neutral, Sustainable and Productive Blue Economy
Risk Assessment of Chemicals	European Metrology (Art. 185 of the TFEU)	Europe's Rail	Water4All "Water security for the planet"
ERA for Health	Artificial Intelligence, Data and Robotics	Cooperative, Connected and Automated Mobility (CCAM)	Animal Health and Welfare*
Rare Diseases*	Photonics	Batteries "Towards a competitive European industrial battery value chain"	Agroecology "Accelerating Farming Systems Transition**"
One Health / Antimicrobial Resistance*	Made in Europe	Zero-emission Waterborne Transport	Agriculture of Data*
Personalised Medicine*	Clean Steel - Low Carbon Steelmaking	Zero-emission Road Transport (ZZERO)	Safe and Sustainable Food Systems*
Pandemic Preparedness* Co-funded or co-programmed	Processes4Planet	People-centric Sustainable Built Environment (Built4People)	
	Globally Competitive Space Systems**	Clean Energy Transition	
		Driving Urban Transitions to a Sustainable Future	

Institutionalised Partnerships (Art 185 or 187 of the TFEU)

Co-Programmed

Co-Funded

\* Calls with opening dates in 2023-24

\*\* Calls with opening dates not before 2022

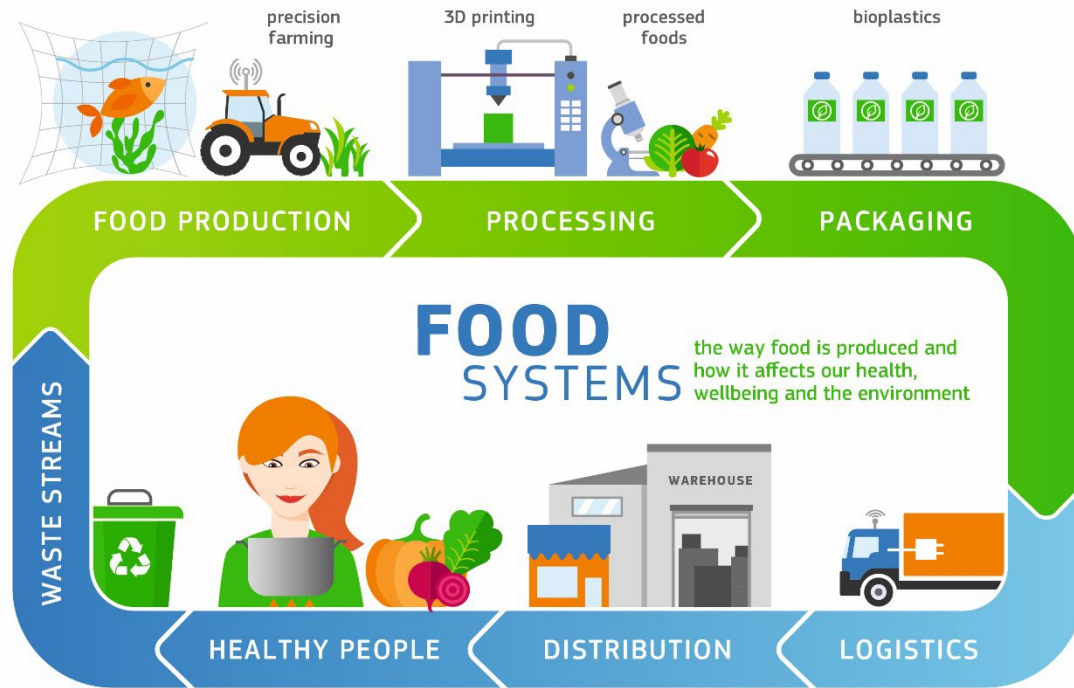


[European Partnerships in Horizon Europe \(europea.eu\)](https://europea.eu)  
[HE Cluster 06 partnerships](#)

- ✓ New ways of working in a **multi-stakeholder approach**
- ✓ Main driver for setting up partnerships is to make the various **R&I-performing actors cooperate** across European borders.
- ✓ In Cluster 06, **8 partnerships** foreseen to contribute to the goals of Cluster 06
- ✓ **Sustainable Food Systems (SFS) Partnership**

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# Food 2030: EU R&I Policy Framework future-proofing our food systems



## Priorities

-  **NUTRITION** for sustainable and healthy diets
-  **CLIMATE** smart and environmentally sustainable food systems
-  **CIRCULARITY** and resource efficiency of food systems
-  **INNOVATION** and empowerment of communities

- Need for a systemic approach to future-proofing food systems by structuring, connecting and scaling-up R&I
- To provide **evidence** for policies and **solutions** (knowledge, methods, technologies, services, business models, etc) addressing 4 priorities.

## Drivers

-  **Research breakthroughs**
-  **Innovation and Investment**
-  **Open Science**
-  **International collaboration**

 #FOOD2030EU

Research and Innovation

 #FOOD2030EU

## Food 2030 Conference Session on 'Food systems and soil health', 5<sup>th</sup> December

NEWS ARTICLE | 6 June 2023 | Directorate-General for Research and Innovation

### Food 2030 conference: Green and Resilient Food Systems



Are you interested in transitioning towards sustainable, resilient and inclusive food systems for the benefit of the environment and economy? Mark your calendar for our Food 2030 conference, which will take place in Brussels and will be web streamed on 4 and 5 December 2023

Registrations for in-person and online participation will open mid-September.

Follow us here for more updates and on Twitter: @EUScienceInnov - #Food2030EU.

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[4-5 Dec in Brussels and online](#)

[Food 2030 conference: Green and Resilient Food Systems \(europa.eu\)](#)

[Registration page](#)

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## Mission Soil updates on the soil health-food nexus

- Mission established “Soil biodiversity” “Carbon farming”, “Soil pollution” and “Restoration and circular economy solutions” as **hotspots for action**.
- Organisation of **business round-tables** (see tomorrow’s session)
- Project funding under Work Programmes 2021, 2022, 2023:
  - 7m€ funding for **project SOIL O-LIVE** on the influence of land management on olive oil quality and safety
  - 15m€ funding for projects **InBestSoil, NOVASOIL, SOILVALUES** to develop new business models for soil health
  - 14m€ for solutions to process food residues (**DeliSoil and Waste4Soil**) and 9m€ for innovations from biowaste (**BIN2BEAN, FENIX, and SOILUTIONS**)
  - 12m€ to develop digital tools to monitor nutrients and chemical or biological stressors in soil and plants with relevance for food safety and nutrition
  - 29 m€ to support soil carbon farming, monitoring, verification, reporting
  - 24m€ soil health indicators and monitoring (incl. through novel tools such as AI)

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# Thank you!

For further information and questions please contact  
the Mission Secretariat:

[EU-HORIZON-MISSION-SOIL@ec.europa.eu](mailto:EU-HORIZON-MISSION-SOIL@ec.europa.eu)

Mission A Soil Deal for Europe:

<http://ec.europa.eu/mission-soil>

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y Tecnología Agraria y Alimentaria





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# EUROPEAN MISSION SOIL WEEK

**Mission Soil Spanish mirror group  
and challenges ahead**

**Jose Manuel González**

Spanish Delegate to Horizon Europe Cluster 6

**Rocío Lansac**, Head of the Spanish Delegation to  
Working Group on Soil Mission; Head of the Soil Mission  
Spanish Mirror Group, INIA



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## Intro

**National mirror group created for each Mission:  
October 2019 (Grupo Espejo)**

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## Aim

Support representatives to elaborate ES position on national soil issues and formulate comments/inputs for mission policy documents.

Identification of activities/projects/interests in Spain within this area. Public/societal engagement.

Establish horizontal interactions with Regions and Sectorial Ministries

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## Composition

**“Core” group** and **enlarged** by some **additional members**.

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Core group: “flexible” in the sense of incorporating those profiles needed at any time.

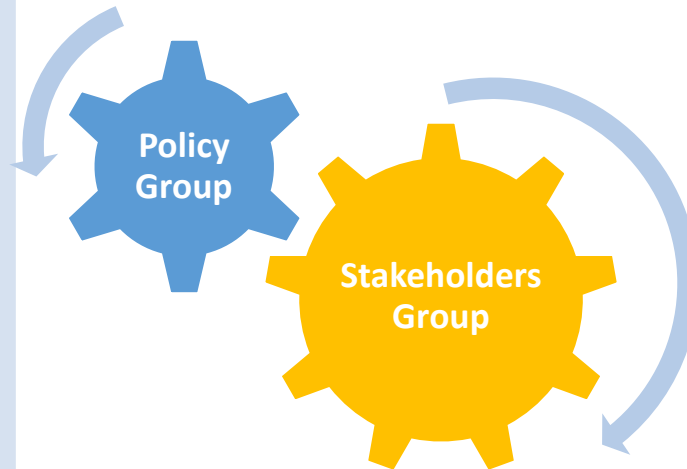
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# Composition: ES Mirror Group Soil Mission

## “Core” Mirror Group

- Ministry for Science and Innovation(MCIN)
- Ministry of Agriculture, Fisheries and Food (MAPA)
- Ministry of Ecological Transition (MITERD)
- Representatives in the Working Group for the Soil Mission (INIA-CSIC, CDTI)
- Spanish Member of the Mission Board
- Spanish Member of the Assembly
- Spanish funding agencies (AEI, CDTI)
- Experts of the Programme Committee (CSIC)
- NCP Soil Mission
- EJP Soil Spanish Coordinator (INIA-CSIC)
- Spanish Representative for 4x1.000 Initiative (MAPA)



## Additional Members

- Experts from Public Research Centers
- Experts from Academia: Universities
- PREPSOIL CSA Spanish participants
- Climate Change Spanish Office (OECC-MITECO)
- Regional Institutions for agrifood research (e.g. IFAPA, CITA, IRTA, IVIA, NEIKER, INTIA)
- Climate KIC – Spain
- Private sector
- Agrarian associations (UPA, ASAJA, COAG, COPLACA)
- LL/LH Spanish initiatives
- NGOs

# Mirror Group Activities

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Regular meetings on need basis

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Define ES position and comments on Mission documents: Mission scope, focus and the alignment with national policies, activities and capacities

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Discuss the alignment with AEI (funding) and MAPA (CAP/ EIP)

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Consider enlargement of the group to incorporate complementary capacities and views

---

Identification of examples of resilient communities/regions

---

Identify activities/projects/plans in Spain within this area

---

Synergies with other mission areas to be explored (e.g. “Climate”, “Waters” or “Cancer”)

---

Public/Societal engagement outreach- Events

# Mirror Group Activities: National Events (I)

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**COP-25 Dec. 12 -2019.** Madrid. Participation in the event “Missions in Horizon Europe: Design and Impact by and for Spanish society” organizing the national co-design session on this area

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**SOST Jun. 18 - 2020.** Virtual session CDTI-SOST about European I+D+i. Citizen engagement meeting with representatives of regional administrations

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**MAPA Jul. 28- 2020.** Mission on “Soil Health and Food”. Conference to capture concerns of the sector in relation to this issue (citizen engagement with representatives from Agriculture Associations, Unions and Scientists)

---

**MAPA Nov. 24 - 2020.** Workshop for the exchange of experiences between operational groups and innovative projects on precision agriculture

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**INIA-CCAA Feb. 23 - 2021.** Coordinating Committee of Spanish Regions

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**MAPA Apr. 7- 2021.** Workshop for the exchange of experiences between operational groups and innovative projects on soils (AEI-Agri) developed by Operational Groups financed by the Rural Development Policy Programs 2014-2020 and by projects of the European research program Horizon 2020

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**IRTA (Cataluña) Apr. 21 - 2021.** Virtual briefing session on the Soil Mission

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**XIX Encounter INIAs Iberoamérica Nov. 23-24 2021.** XIX meeting of the INIA of Ibero-America (agricultural soils and carbon sequestration). Diffusion of the Mission “A Soil Deal for Europe”, global approach.

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**CDTI Feb. 21 - 2022** Horizon Europe Missions Day: News and Calls 2021

# Mirror Group Activities: National Events (II)

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**Red de Suelos Española Nov. 21 -2022.** Córdoba.

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**PREPSOIL Jan. 14- 2023.** Regional Workshop to assess soil needs. Valencia

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**Soil Olive. Jan. 26 - 2023.** Kick-off. Jaén

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**NATIOONS. March, 1 2023.** National Workshop, Madrid

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**PREPSOIL March 17 2023.** Regional Workshop to assess soil needs. Jaen

---

**PREPSOIL Apr. 12 2023.** Regional Workshop to assess soil needs. Extremadura

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**GRA Apr. 24-26 2023** Government Meeting of the Global Research Alliance on Greenhouse Gases Originating from Agriculture (GRA). Madrid

# Mirror Group Activities: Projects



- **EJP SOIL** Towards climate-smart sustainable management of agricultural soils
- **SMS SOIL MISSION SUPPORT**  
CSA: Towards a European research and innovation roadmap on soils and land management



- **PREP SOIL** CSA Preparing for the 'Soil Deal for Europe' Mission

# EJP SOIL

European Joint Programme “Towards climate-smart and sustainable management of agricultural soils”



# EJP SOIL

## Towards climate-smart sustainable management of agricultural soils

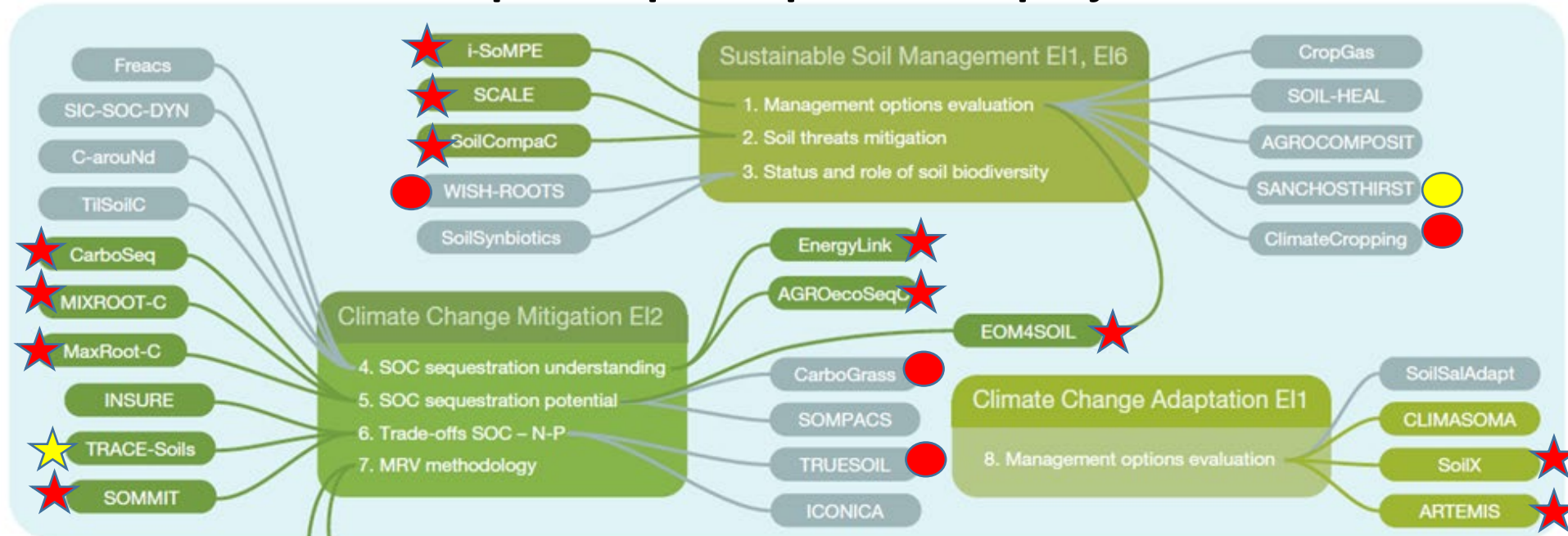






- **26 Institutions from 24 countries**
- **Coordinator:** INRAE (Francia)
- **Duration:** 5 years (2020-2025)
- **EU Funds:** 40 M€ (+40 M€ MS)



# Landscape of EJP SOIL research projects

## Spanish participation: 25 projects



-  CSIC Internal-Coord
-  CSIC Internal calls
-  External calls-Coord
-  External calls



**November 20, 2023** Salón de Actos del IQF "Blas Cabrera". Consejo Superior de Investigaciones Científicas.  
c/ Serrano, 119. 28006 Madrid

- Results of 25 EJP soil projects (ES)
- Panel of scientists and policy planners

Aim:

To promote discussion, the workshop will be in person and in Spanish. Researchers, policymakers, farmers and organizations, among others, will meet to discuss the knowledge gaps detected by the projects, the challenges in the sustainable management of agricultural soils and the applicability of the EJP SOIL results

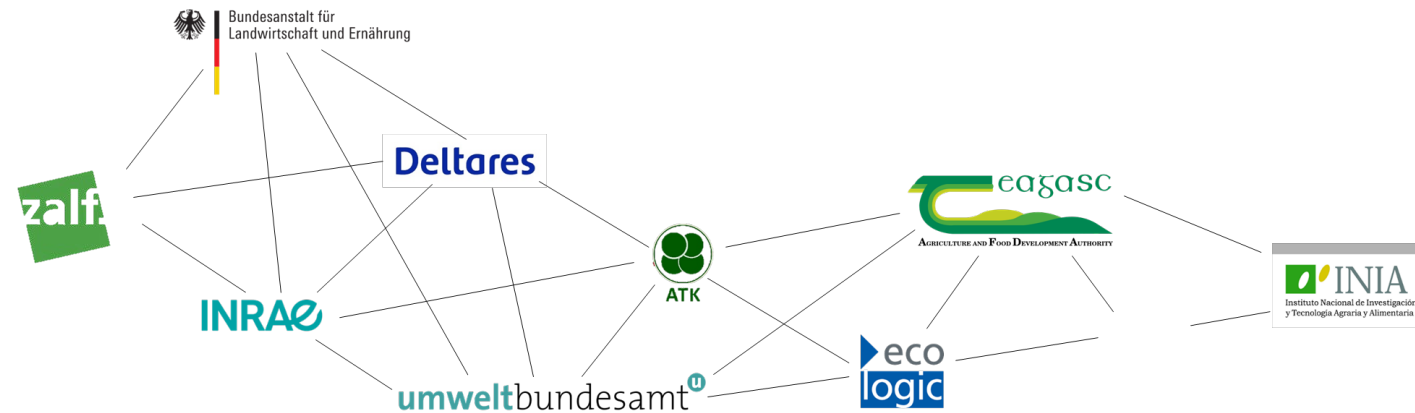


<https://ejpsoil.eu/about-ejp-soil/news-events/item/artikel/ejp-soil-spanish-national-workshop-and-european-mission-soil-week>

# CSA SOIL MISSION SUPPORT (SMS)

## Towards a European research and innovation roadmap on soils and land management

### Soil Mission Support



- 10 Institutions from 7 countries
- Coordinator: BLE (Germany)
- Duration: 2 years
- EU Funds: 1,1 M€

## Aim

- SMS will identify criteria for living labs and lighthouses, aiming to demonstrate solutions.

### Map of Living Labs and Lighthouses

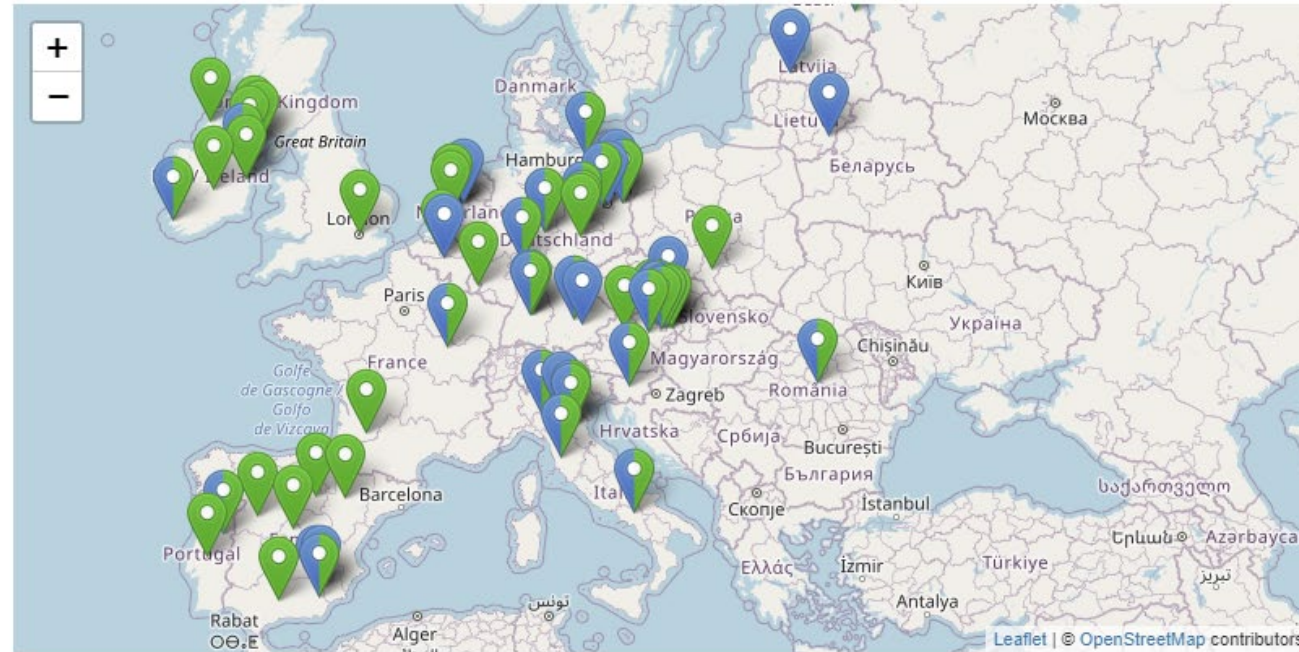
Please select:

- All (117)
- Living labs (73)
- Lighthouses (44)

Filter for LL & LH:

- Agriculture (1)
- Forestry (86)
- Urban (0)
- Protected areas (11)
- Industry (57)
- Infrastructure (11)
- Other (18)

Submit



Available living labs and lighthouses map: [Map \(soilmissionsupport.eu\)](http://Map(soilmissionsupport.eu))

# CSA “PrepSoil” - Preparing for the ‘Soil Deal for Europe’ Mission



- Academic partners**
- AU
  - WUR
  - SLU
  - INRAE
  - NIBIO
  - ZALF
  - IUNG
  - CSIC
  - ÖMKi
  - DELTARES

- Consulting experts**
- LESPROJEKT
  - TRUST-IT
  - COMMPLA

- EU & national associations \***
- ENOLL
  - RE-SOIL
  - COPA-COGECA
  - ACR+
  - F-PCTEX (ERIAFF)
  - ACTA

**Total Budget: 4.990.230 €**  
**Time: 36 months**

**2022-2025**

## General Objective

A multidisciplinary approach combining soil sciences, open science practices and other interdisciplinary sciences, monitored via Key Performance Indicators (KPIs), in line with the Mission ‘Soil Health and Food’ workplan and the expected outcomes and impacts.

# CSIC Contribution & Budget



**Spain will participate through CSIC in following tasks:**

- Dissemination, exploitation, communication and stakeholder management.
- Identification, mapping and evaluation of EU regional soil needs
- WEB portal, online community engagement and training
- Knowledge transfer and co-creation in regional living labs
- Promoting soil education, awareness and engagement of Communities of Practice

## **CSIC's Contribution:**

- National Institute for Agricultural and Food Research and Technology (INIA)
- Zaidin Experimental Station (EEZ)

**CSIC estimated budget: 284.735.00 €**

# WP 2021 – Convocatoria Misión de Suelo



10 proyectos multinacionales  
todos con participación española  
Comenzando en 2023

**EU Mission:  
A soil deal for Europe  
2021 Call of proposals**

**40 proposals submitted**

**10 research & innovation projects selected**

**€63 million funding**



#HorizonEU #EUmissions #MissionSoil

## WP 2021 – Convocatoria Misión de Suelo



### R&I

- SOIL-O-LIVE
- SOLO



### LL&LH

- NATI00Ns



### Monitoreo

- AI4SOILHEALTH & BENCHMARKS



### Compromiso ciudadano

- HuMUS
- NBSoil



### Dimensión de negocio

- InBestSoil & NOVASOIL & SoilValues



# WP 2022 – Convocatoria Misión de Suelo



- 10 topics 95 M€
- Muchas propuestas con participación española:

## LOESS

**SOILL**



Project **Credible**



**MaRViC**



BIOSERVICES

**Waste4Soil**

**SOB4ES**

~ *DeliSoil* ~



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# Thank you!

Mission A Soil Deal for Europe:

<http://ec.europa.eu/mission-soil>

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# EUROPEAN MISSION SOIL WEEK

The Partnership for Research and  
innovation (PRIMA) Role in Soil  
Health, Water, and Food Production

**ANTONELLA AUTINO**

PROGRAMME COORDINATOR



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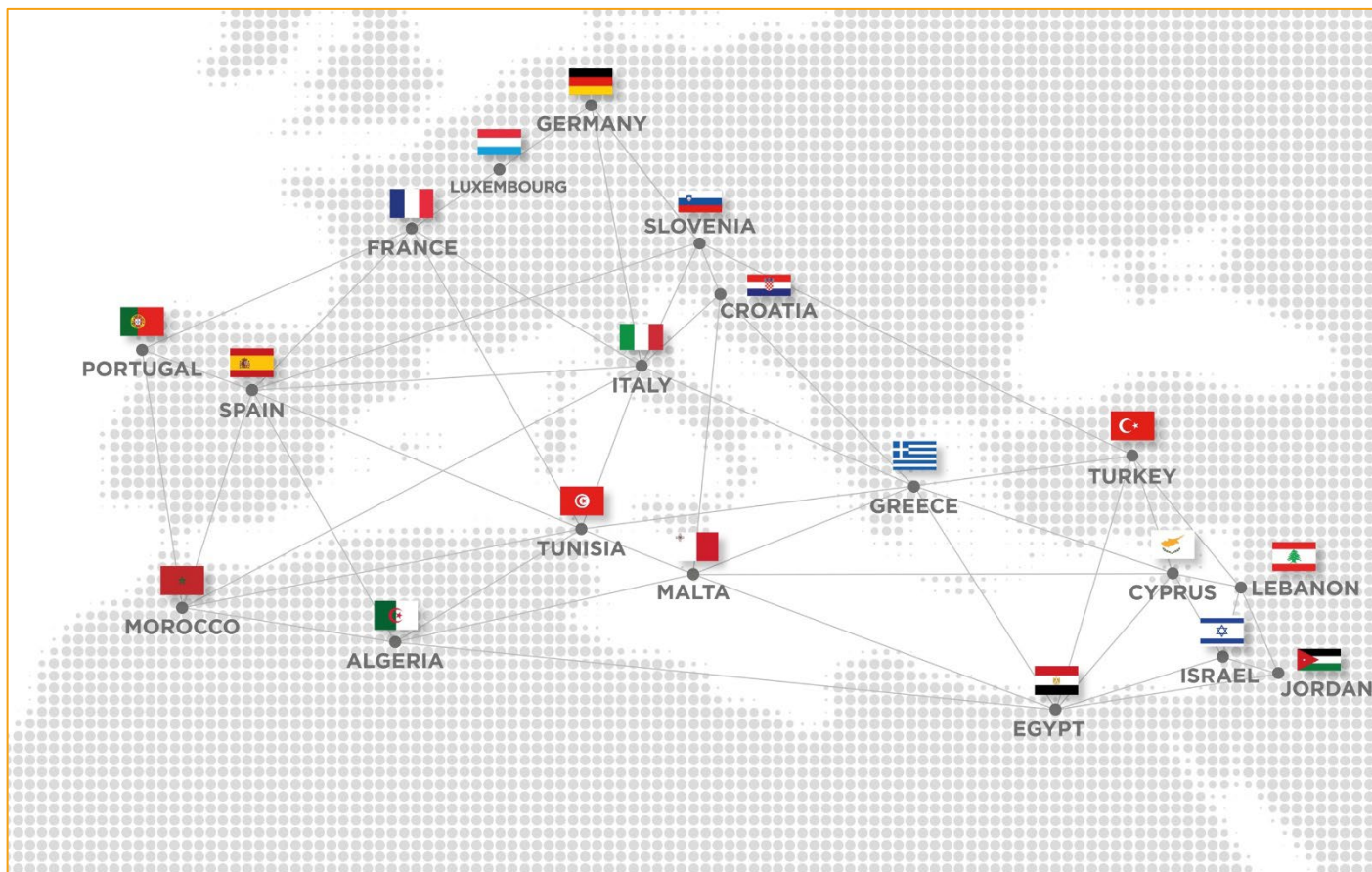


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## PRIMA Partnership

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EU Partnership composed by

- ✓ **11 EU MS**
- ✓ **8 Third Countries**
- ✓ **3 Associated Countries to Horizon Framework Programme**

€ 500 Million EUR under H2020  
+ 215 Million EUR for its extension 2025/2027 under Horizon Europe

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### Unique Mediterranean Climate

1. Hot, dry summers.
2. Mild, wet winters.
3. Impacts on soil health.

### Distinct Soil Conditions

1. Low organic matter, pH imbalances nutrient deficiencies
2. Salinisation
3. Erosion.

### Challenges

1. Soil degradation .
2. Desertification affects around 80% of southern Mediterranean and 30% of northern farmland.
3. Food insecurity



## PRIMA vs Mission soil's objectives

EU Mission a Soil Deal for Europe	PRIMA's Objectives
<b>Objective 1:</b> Reduce land degradation, including desertification and salinisation.	➤ PRIMA OPERATIONAL OBJECTIVES: 2/LAND AND WATER SUSTAINABILITY PRIMA supports the adoption of agricultural practices that prevent soil erosion, salinization, and the depletion of soil fertility.
<b>Objective 2:</b> Conserve (e.g., forests, permanent pastures, wetlands) and increase soil organic carbon stocks.	➤ 4/ SMART AND SUSTAINABLE FARMING PRIMA aims to conserve soil resources, including measures to promote the preservation and enhancement of soil organic carbon.
Objective 3: No net soil sealing and increase the re-use of urban soils for urban development.	
<b>Objective 4:</b> Reduce soil pollution and enhance restoration	➤ 4/ SMART AND SUSTAINABLE FARMING PRIMA aims to reduce soil pollution and actively supports soil restoration efforts
<b>Objective 5:</b> Prevent erosion	➤ Cross-Cutting theme: SOIL SUSTAINABILITY PRIMA contributes to the prevention and effective management of soil erosion
<b>Objective 6:</b> Improve soil structure to enhance habitat quality for soil biota and crops.	➤ 4/ SMART AND SUSTAINABLE FARMING PRIMA focuses on the preservation of suitable habitats for soil biota and crop growth.
Objective 7: Reduce the EU global footprint on soils.	

## Reduce Land Degradation and Desertification

Aligned with Mission Objective 1: Reduce land degradation, including desertification and salinisation

Aligned with Mission Objective 2: Conserve (e.g., forests, permanent pastures, wetlands) and increase soil organic carbon stocks.

MARA-MEDITERRA to open up the NbSs tailored to specific regions with farmers

SALAM-MED Projects

1. Testing Nature-Based Solutions
2. Enhancing Resilience in Mediterranean Drylands
3. Restoring Degraded Ecosystems in Arid Lands

REACT4MED Project

1. Upscale Sustainable Land and Water Management
2. Initiate and support restoration actions 2000 km<sup>2</sup> agroecosystems

HALOFARMS Project: Halophytes for Salinization

## Prevent erosion

aligned with Mission Objective 5: Prevent erosion

4CE-MED Project

1. Integrating *Camelina sativa* L. Crantz into conventional cropping systems
2. Decreasing Soil Erosion



## Soil Organic and Mineral Fraction Enhancement

Aligned with Mission Objective 2: Conserve (e.g., forests, permanent pastures, wetlands) and increase soil organic carbon stocks.

- REVINE Project: synergy of vineyard waste with other organic materials to create superior biofertilizers
- ISFERALDA Project: Date Palm Residue Amendment
- SUSTAINOLIVE Project: uses olive byproducts for composting
- REMEDIATION Project: Bio-char from olive and cork tree Biomass
- FARM4CLIMATE Project: Smart Governance for Carbon Farming
  
- TRANSITION AGROFORESTRY
- CONSERVETERRA
- CAMA





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## Soil Pollution

aligned with Mission Objective 4: Reduce soil pollution and enhance restoration

- Decontamination of Agricultural Soils
  - RESIDUE Project: developing technology that detoxifies organic contaminants in irrigation wastewater

## Boosting Soil Microbiology

Aligned with Mission Objective 6: Improve soil structure to enhance habitat quality for soil biota and crops

ProSmallAgriMed: Beneficial Soil Microbiota

OPTIMUS PRIME: Natural Products and Microorganisms

RESCHEDULE: improving soil microflora for healthier soils,

RECROP Project: Microbial Inoculants

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## Key messages

- 1. Collaboration for Global Impact:** PRIMA and the EU Mission "A Soil Deal for Europe" share common goals in addressing soil-related challenges, emphasizing the importance of effective collaboration to establish common objectives and maximize impact on a global scale.
- 2. Global Relevance of Soil Issues:** Soil degradation, desertification, and land degradation are global challenges that require collaborative efforts beyond Europe's borders to promote sustainable soil and water conservation, recognizing the global significance of these issues.
- 3. Sustainable Soil Management:** PRIMA's focus on innovative soil management practices, reduced pollution through responsible agricultural inputs, and learning from best practices worldwide highlight the commitment to sustainable soil management, which is essential for addressing soil-related challenges effectively.





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# Thank you!

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@euagrifood



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# EUROPEAN MISSION SOIL WEEK

**Soils and food systems: A  
Mediterranean perspective**

**Prof. Pandi Zdruli**

Senior Research Scientist, CIHEAM Bari

21 November 2023



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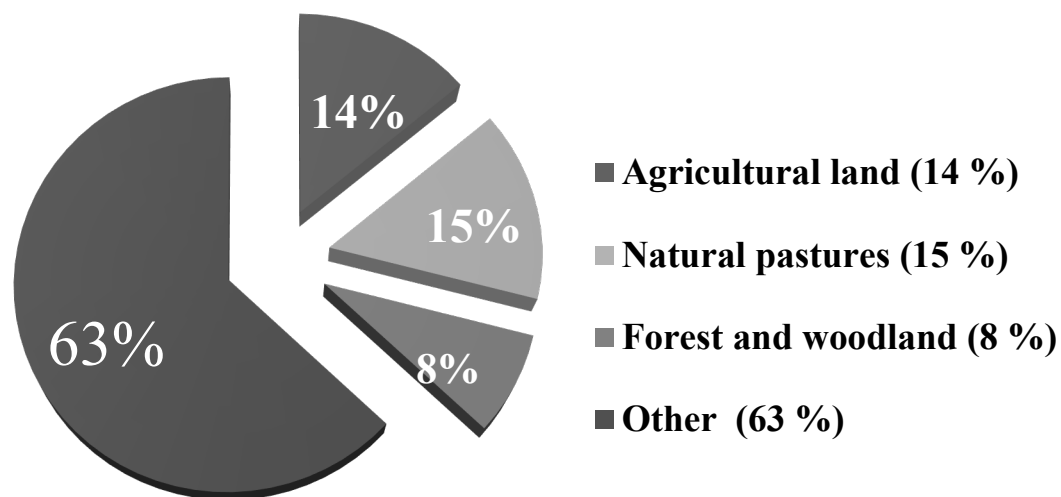




Mediterranean countries and their different limits



## MEDITERRANEAN LAND RESOURCES



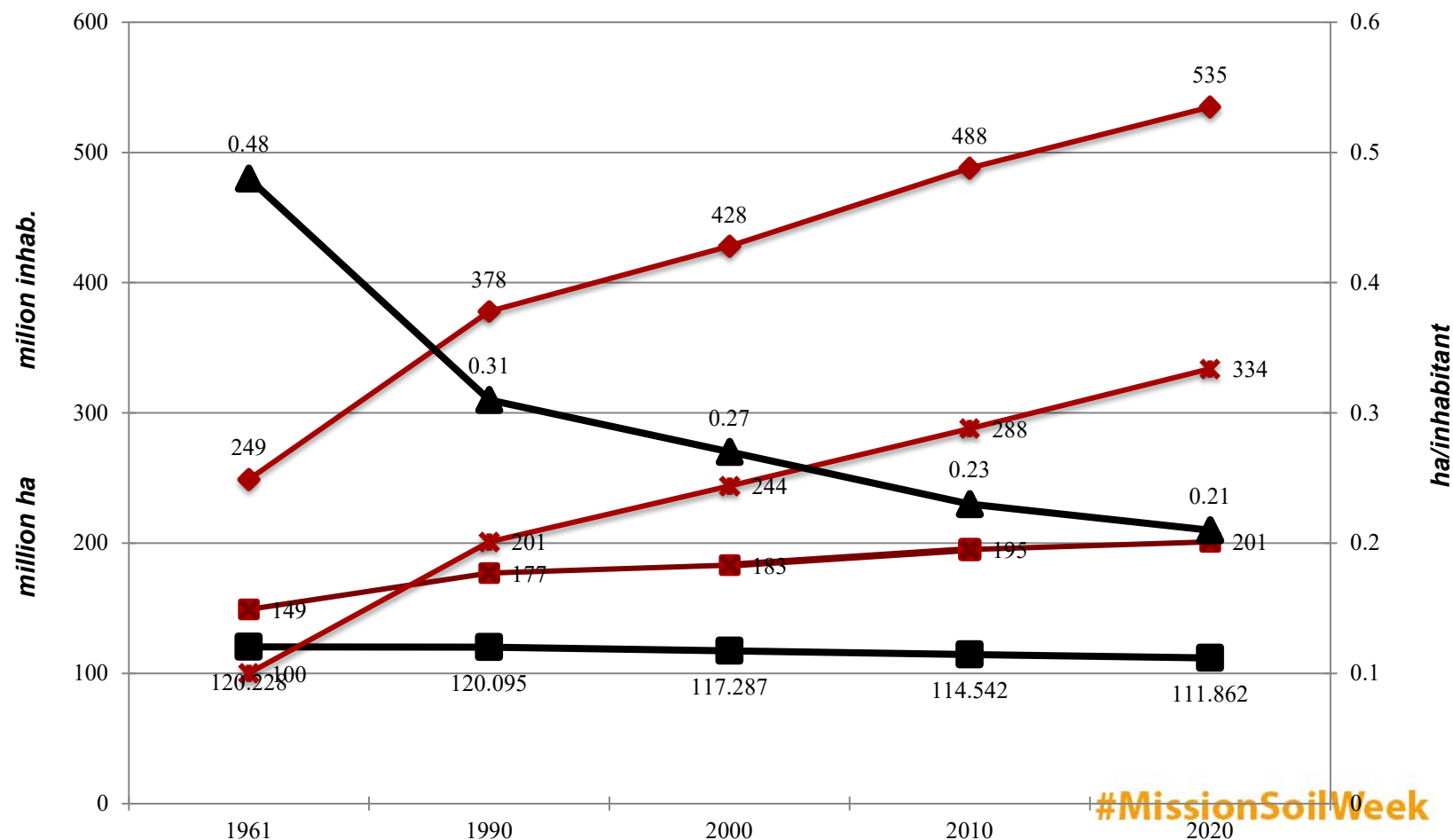
Zdruli, 2014

- 14 % of Mediterranean land is used by agriculture; in MENA only 5 %
- 854 million ha of total land but only 118 million ha suitable for farming
- 538 million ha with limited biomass potential or sealed by urbanisation

Drylands (as described by UNCCD) cover **33.8 %** of the Northern Mediterranean countries while in the **Middle East North Africa (MENA)** they reach as much as **61.3 %**

## Relationships between land resources and population trends

- Arable land (million ha)
- ◆ Population (million people)
- Population increase in N. Med (million people)
- ✱ Population increase in MENA (million people)
- ▲ Arable land per inhabitant (ha/inhab)



**8.3 million ha of arable land loss** in the Mediterranean for the period 1961-2020 due to land degradation and urbanization



## Drivers and processes of land degradation and desertification with cross border relevance

### Climate change will worsen the situation as the region becomes hotter and drier

- Unsustainable land use
- Overgrazing
- Soil erosion by water
- Wind erosion (Sand Dust Storms)
- Drought
- Climate change
- Cross border infrastructure causing soil sealing and land take



#### Risk and Vulnerability Mapping of Sand Dunes, a Prerequisite for Land use Planning in the Egyptian Deserts"



H.Efaat and M.N.Hegazy

National Authority for Remote Sensing and Space Sciences  
(NARSS)

Email: haeffat@yahoo.com

## The controversies of the food systems

- Heavily specialized,
- Rely on long-distance trade,
- Are calibrated to maximize yields in ideal conditions and not to resist to adversities,
- Depend heavily on fossil fuels,
- Generate high pressure on the natural capital.

BUT

We must improve food systems' capacity to anticipate, prevent, absorb, adapt to shocks and stresses. It is clear that the resilience of food systems can be achieved only when the interplay between the way food is consumed, processed, produced and distributed is addressed adequately.

The Mediterranean diet is the best example to follow

**Two PRIMA  
funded projects  
in the  
Mediterranean  
dealing with  
soil  
management**

The logo for CReACT 4MED features the word "CREACT" in green, with a green circular arrow around the "C". Below it, "4MED" is written in green, with a yellow arrow pointing from the "4" towards the "M".

**Inclusive Outscaling of  
Agro-ecosystem  
Restoration ACTions  
for the Mediterranean**



**Thrassyvoulos Manios**

Vice-Rector of Finance, Planning and Development  
Professor at the Department of Agriculture  
Hellenic Mediterranean University



**Ioannis Daliakopoulos**

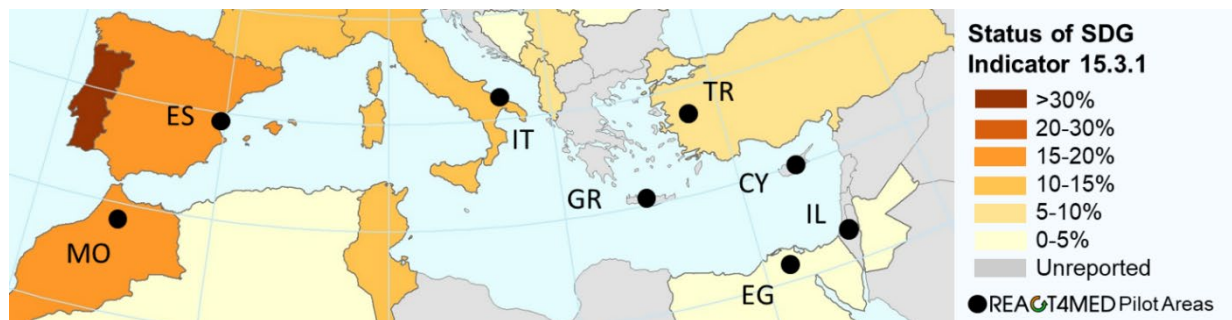
Assistant Professor  
Department of Agriculture  
Hellenic Mediterranean University





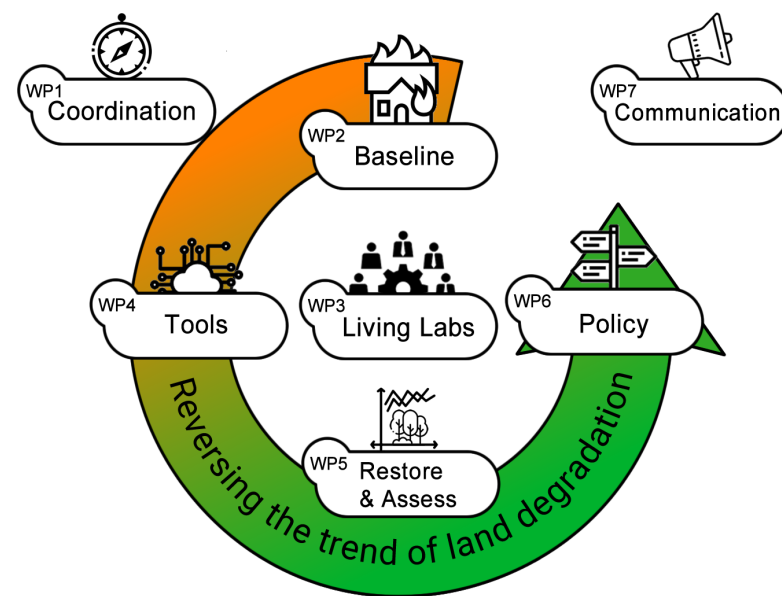


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#	Pilot Area	Threat	SLWM practices	Area
1	Troodos Mountains (CY)	Soil erosion	Communal mountain terrace maintenance and capacity building	113 km <sup>2</sup>
2	Heraklion (GR)	Soil erosion due to overgrazing	Shift to silvopastoral system with over 25 ha of newly forested land	337 km <sup>2</sup>
3	Stornara and Tarra Apulia (IT)	Salinisation, groundwater decline	Advanced irrigation systems, remote technology for water use efficiency, water harvesting	86 km <sup>2</sup>
4	Cànyoles (ES)	Soil erosion	Chopped pruned branches as mulch to reduce soil/water losses	642 km <sup>2</sup>
5	Merchouch (MO)	Soil quality degradation and erosion	Conservation agriculture, diversified cropping systems, integrated soil fertility management	250 km <sup>2</sup>
6	Bethlehem of Galilee (IL)	Biodiversity decline	Orchard transformed into a food forest	500 km <sup>2</sup>
7	Menemen (TR)	Soil salinity, alkalinity	Plant Growth-Promoting Rhizobacteria, green manure, enhancing organic matter, enhancing drainage	200 km <sup>2</sup>
8	Tamia (EG)	Soil salinity and erosion	Soil amendments, mulching, drainage, modern irrigation, salt-tolerant varieties	124 km <sup>2</sup>

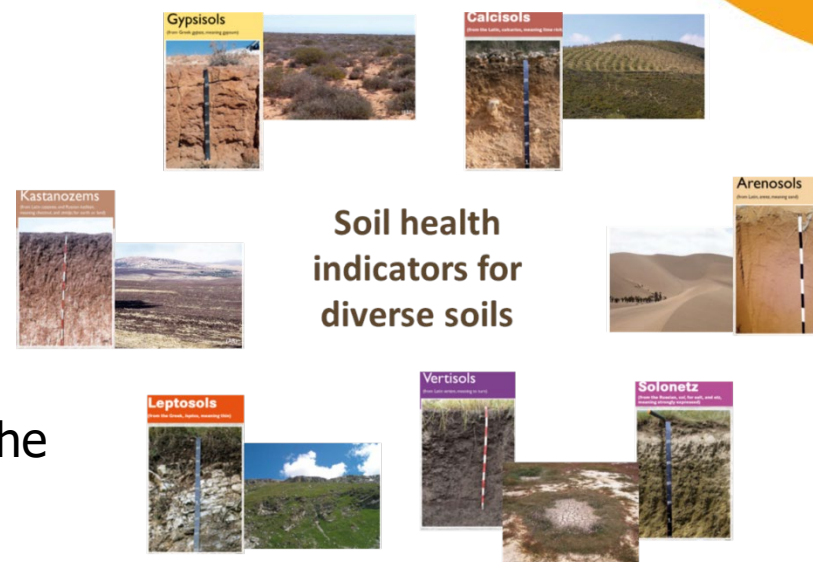
# EUROPEAN MISSION SOIL WEEK



Decision Support Toolbox LandDS system for outscaling/upscaling

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# soils4med



engage with stakeholders in line with the **Living Lab** approach

develop policy relevant **integrated indicator sets**

generate the **first region-wide harmonized soil health datasets** for the Mediterranean Region

enhance **region-wide soil health mapping**

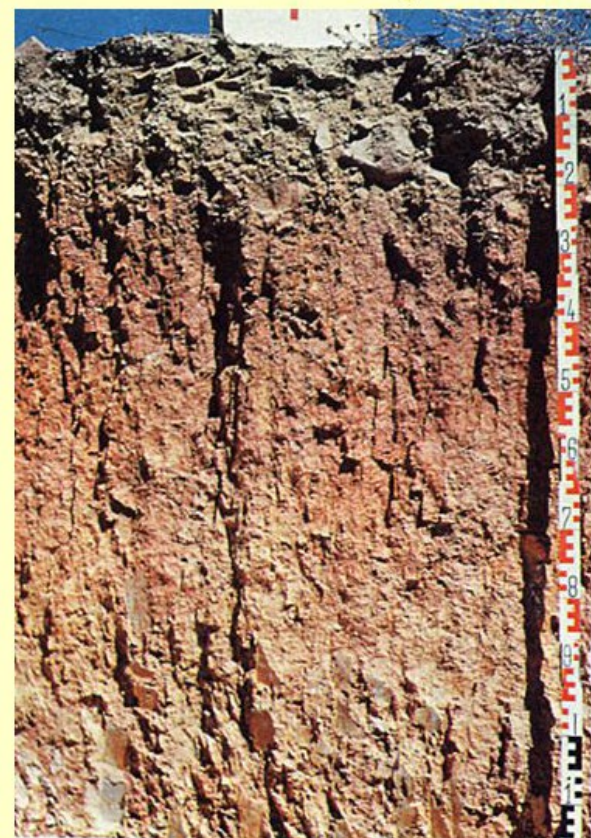
Design and implement **country-based soil information systems**

**Soil Atlas of the Mediterranean**

# Thank you

## Mediterranean soils (terra rossa)

- A Thin mull humus forming in eroded remains of Bt horizon
- Bt<sub>f</sub> Illuvial horizon enriched with clay and iron, has become red-coloured. High clay content renders them relatively impermeable and prone to erosion
- C Parent material (commonly calcareous) but in this case composed of Palaeozoic shales





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# EUROPEAN MISSION SOIL WEEK

**Soil Health and Food –  
A farmer's perspective**  
Alfred Grand, GRAND FARM  
Farmer

Madrid, 22/11/2023



#MissionSoilWeek #MissionSoil #EUMissions



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**Trained by earthworms ...**



**... to understand the value of soil**

## Alfred Grand

### GRAND FARM for Research and Demonstration

- Soil Health
- Agroforestry
- Market Gardening



### VERMIGRAND Naturprodukte GmbH

- We as humans cannot create soil
- Biodiversity rules nature





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GRAND GARTEN

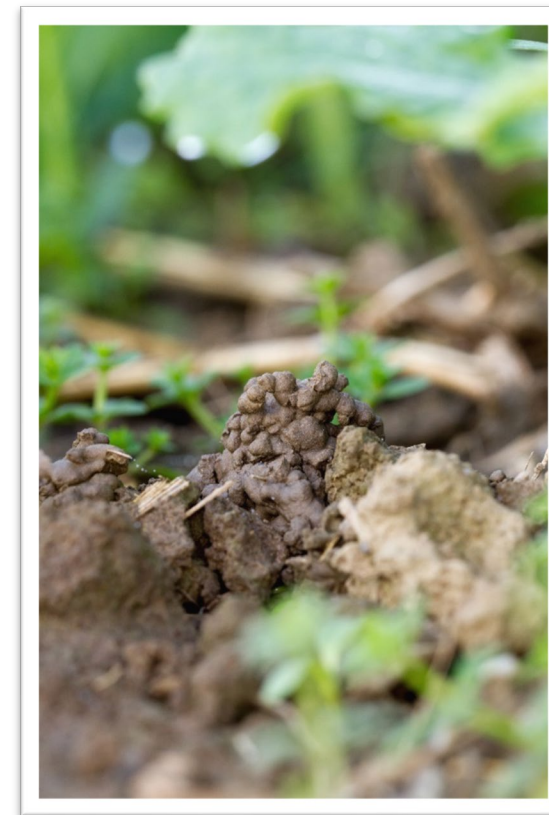
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### Soil Health and Food:

Healthy soil is a resource for nutritional and clean food and the life in the soil is the most important factor, contributing not only to all soil functions, but especially to food quality

### Soil Health and Food:

Disseminating the topic of soil health to citizen is the easiest through food. For this, we need the direct communication between producer and consumer.



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A group of six people, three men and three women, are standing in a line in an outdoor setting, likely a field or construction site. They are all wearing heavy winter work clothes, including jackets, hats, and gloves. The person on the far left is wearing a blue jacket and a yellow hard hat with a 'soil' logo. The person on the far right is wearing a brown jacket and a black beanie. The background shows a field with some bare bushes and a fence. The sky is overcast. A large white text overlay is centered over the group.

Can we do  
even more?



## Market gardening and the SDGs:

12 out of 17 goals, where Market Gardening has an impact:

**SDG 1: No poverty**

**SDG 2: Zero hunger (2.1, 2.2, 2.3, 2.4, 2.5, 2.a, 2.b)**

**SDG 3: Good health and well-being**

**SDG 6: Clean water and sanitation (6.3, 6.4, 6.5)**

**SDG 7: Affordable and clean energy (7.2, 7.a)**

**SDG 8: Decent work and economic growth (8.2, 8.3, 8.4, 8.9)**

**SDG 11: Sustainable cities and communities (11.a, 11.b)**

**SDG 12: Responsible production and consumption (12.2, 12.3, 12.4, 12.5, 12.7, 12.8, 12.a, 12.c)**

**SDG 13: Climate action (13.1, 13.3, 13.b)**

**SDG 14: Life below water (14.1)**

**SDG 15: Life on land (15.1, 15.2, 15.3, 15.5, 15.6, 15.8, 15.9)**

**SDG 17: Partnerships for the goals (17.6, 17.7, 17.16, 17.17)**



### 3 Key messages:

When we think about soil health and food, we need to move from the technical-chemical perspective more to a natural-microbial perspective.

**Nature based solutions!**

If we don't touch farmers, citizens and decision makers by their heart and their mind, we are lost!

**We need the people!**

We need to fight all problems at the same time and have to find methods for each sector, which does solve multiple challenges at once.

**Let's take a systemic approach**



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# Thank you!

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@euagrifood



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Instituto Nacional de Investigación  
y Tecnología Agraria y Alimentaria





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## Our speakers – 2<sup>nd</sup> part

# EUROPEAN MISSION SOIL WEEK



**Antonio José Manzaneda**

Professor

*Universidad de Jaén*



**Ansa Palojärvi**

Senior Scientist, DeliSoil project coordinator

*Natural Resources Institute Finland (LUKE)*



**Sara Daniotti**

Project Manager, Bin2Bean project coordinator

*Consorzio Italbiotec*

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# EUROPEAN MISSION SOIL WEEK

SOIL HEALTH FOR FOOD:  
THE SOIL O-LIVE PROJECT

Antonio J. Manzaneda

Universidad de Jaén

21/11/2023

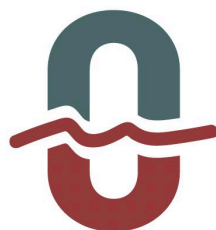


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# SOiLO-LiVE

SOIL BIODIVERSITY AND FUNCTIONALITY  
OF MEDITERRANEAN OLIVE GROVES

Call: HORIZON-MISS-2021-SOIL-02-03  
Linking soil health to nutritional and safe food

## Project Information

### SOIL O-LIVE

Grant agreement ID: 101091255

### DOI

[10.3030/101091255](https://doi.org/10.3030/101091255)

### Start date

1 January 2023

### End date

31 December 2027

### Funded under

Food, Bioeconomy Natural Resources, Agriculture and Environment

### Total cost

€ 6 988 660,00

### EU contribution

€ 6 988 660,00



### Coordinated by

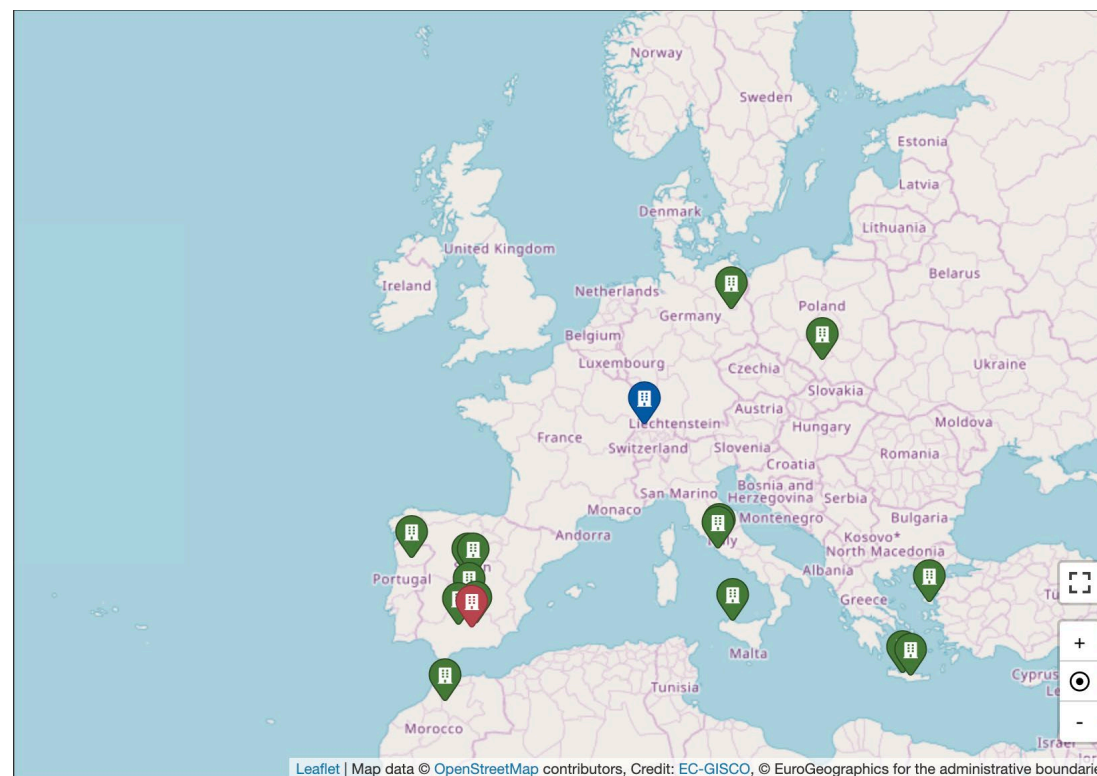
UNIVERSIDAD DE JAEN

 Spain

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## Participants

- UNIVERSITA DEGLI STUDI ROMA TRE
- FREIE UNIVERSITAET BERLIN
- UNIVERSIDAD DE CASTILLA - LA MANCHA
- PANEPISTIMIO AIGAIUO
- CSIC
- UNIVERSIDADE DE TRAS-OS-MONTES E ALTO DOURO
- ASOCIACION ESPANOLA DE NORMALIZACION
- ELLINIKO MESOGEDIAKO PANEPISTIMIO
- ELLINIKOS GEORGIKOS ORGANISMOS – DIMITRA
- UNIWERSYTET SLASKI W KATOWICACH
- UNIVERSITA DEGLI STUDI DI PALERMO
- CONSIGLIO NAZIONALE DELLE RICERCHE
- ECOLE NATIONALE D'AGRICULTURE DE MEKNES
- DEOLEO GLOBAL SA
- NUTESCAL S.L.
- UNIVERSITY OF BASEL





**Olive is the most important fruit tree in Europe, particularly in the Mediterranean Basin, with significant socioeconomic impact.**



**Olive produces edible fruits and high-quality, storable oil – a crucial part of the Mediterranean diet**

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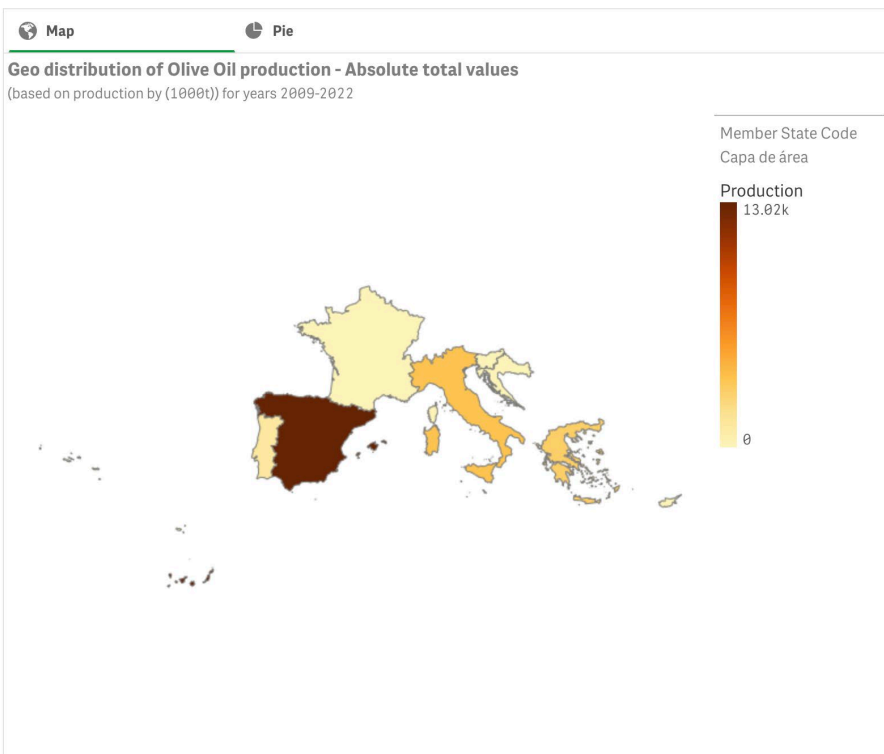


<https://agridata.ec.europa.eu/extensions/DashboardOliveOil/OliveOilProduction.html>

SELECT VIEW: **Absolute**   

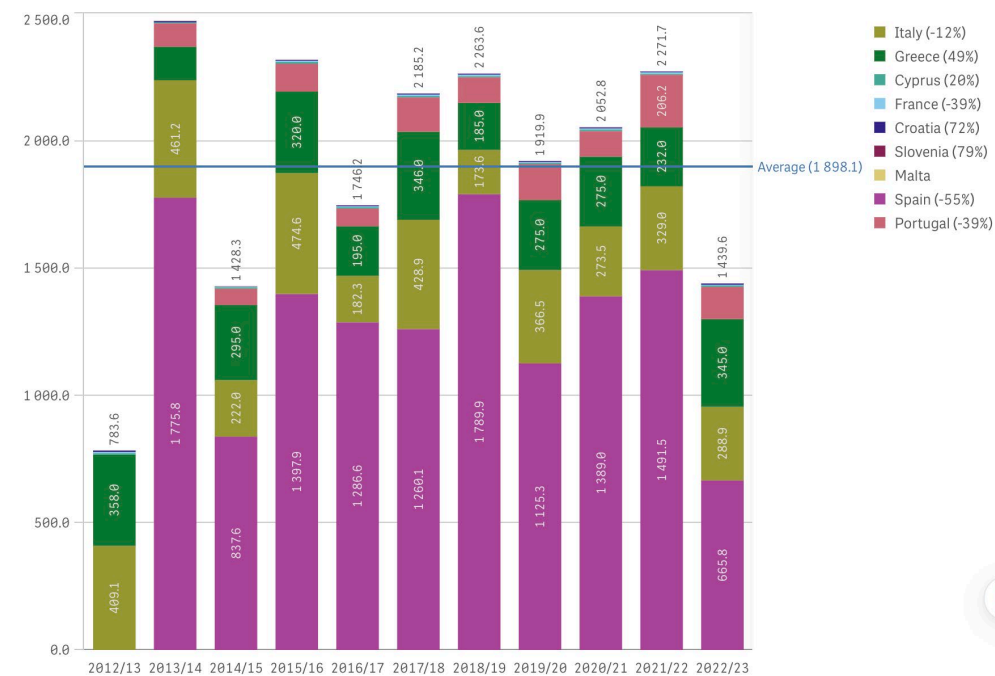
Member State  Marketing Year  By Year  Production Quantity

Latest production data  
update:  
30/10/2023



**Olive Oil production**

(based on production by (1000t)) for years 2009-2022



(variation 2022/23 vs 2021/22)



## Evolution of land dedicated to olive growth (hectares)

YEAR	WORLD	EUROPE	(%)
1981	5.999.445	3.356.978	55.95
1991	7.432.408	4.311.989	58.2
2001	8.441.532	4.775.994	56.6
2011	10.067.577	4.870.977	48,4
2021	10.338.179	5.045.169	48.8

<https://www.fao.org/faostat/en/#data/QCL>

## Environmental issues – Soil health

Member State  Marketing Year  By Year  Production Quantity

Map  Pie

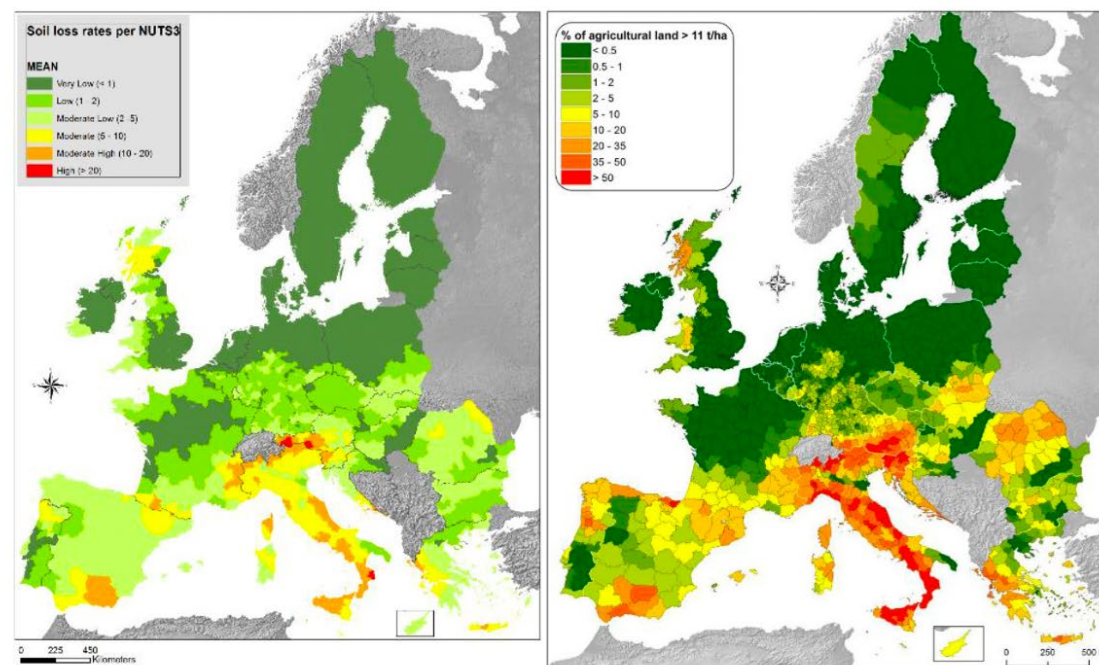
### Geo distribution of Olive Oil production - Absolute total values

(based on production by (1000t)) for years 2009-2022

Member State Co  
Capa de área

Production  
13.02k

0



*Soil erosion by water (tonnes per ha per year), 2010, EU-28, NUTS 3 (left) and Severe soil erosion in agricultural lands (right) - % of agricultural land with > 11t/ annually.*

*Source: Joint Research Centre, European Commission*

## Environmental issues – Strong soil erosion



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**29-47 tones of soil x ha yr<sup>-1</sup>**

**29- 40% of fertile soil**

## Environmental issues – Poor management



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**Soil pollution copper & pesticides**  
**Soil compaction**  
**Poor carbon stock**  
**Salinization**

**Likely:**  
**Excess of N**  
**Diffuse pollution – Microplastics**



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**SOiLO-LiVE**

SOIL BIODIVERSITY AND FUNCTIONALITY  
OF MEDITERRANEAN OLIVE GROVES

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To perform the first rigorous diagnostic of the whole environmental situation of olive orchard soils at a broad scale, comprising the most important areas and agronomic modes of olive production across the Mediterranean region and its relationships to olive oil quality across the food chain.



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## **SPECIFIC GOALS**

### **GOAL 1:**

To analyze the impact of pollution and land degradation on soils from olive groves in terms of multi-biodiversity and ecological function at different levels of organization and scales.

### **GOAL 2:**

To investigate the relationship of soil health status with the quality and safety of olive oil.

### **GOAL 3:**

To implement effective soil amendments and cutting-edge ecological restoration practices that promote manifest soil biodiversity and functionality enhancements that should be eventually translated to improvements in olive oil quality and safety.

### **GOAL 4:**

To define rigorous ecological thresholds that allow the implementing future explicit norms and regulations to design a novel future certification for healthy soils in European olive oil.

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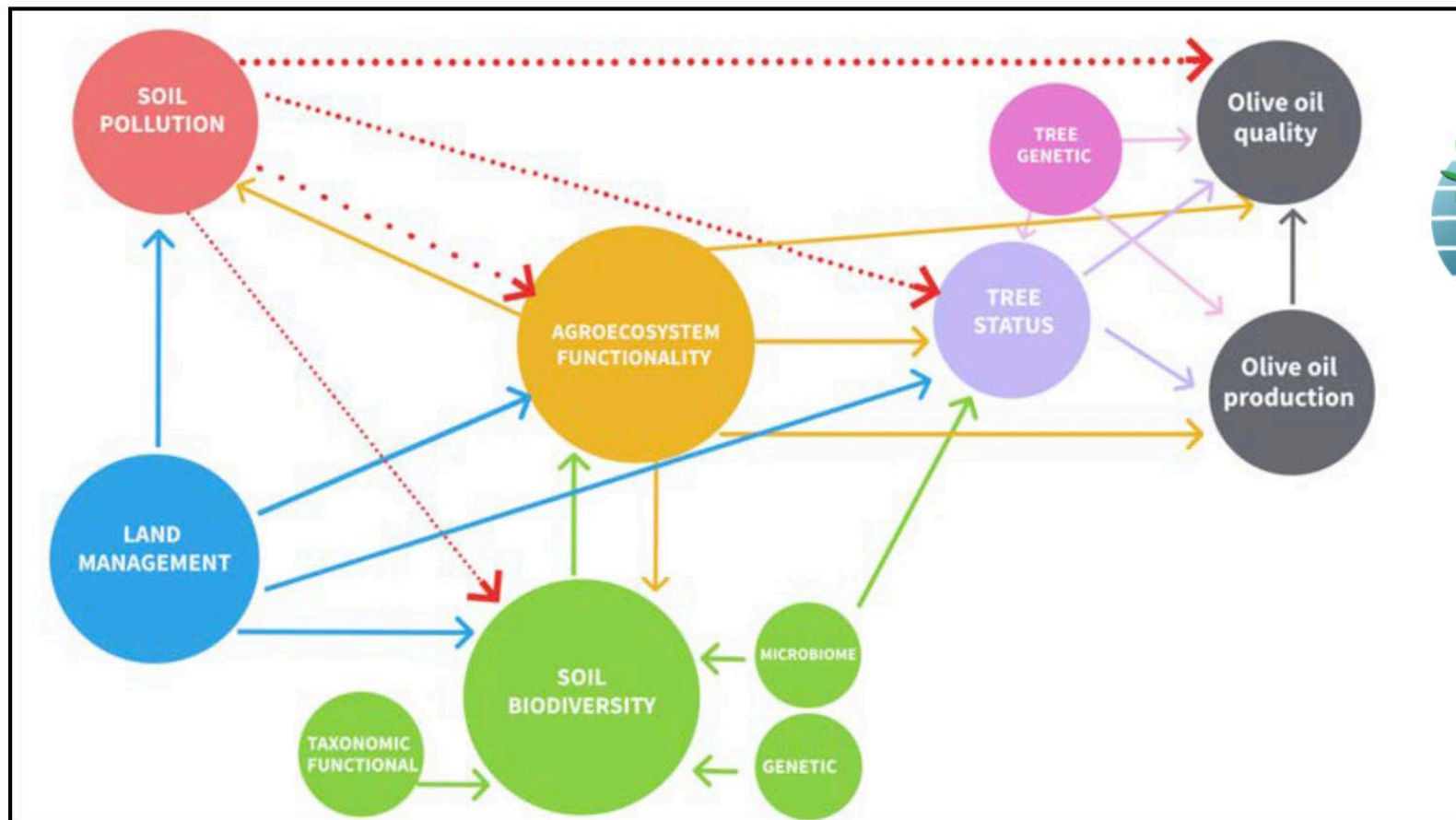


52 selected olive orchards

We will be able to develop measurable key performance indicators (KPIs) that elicit the connection between soil health and the main food quality-related characteristics for olive oil.

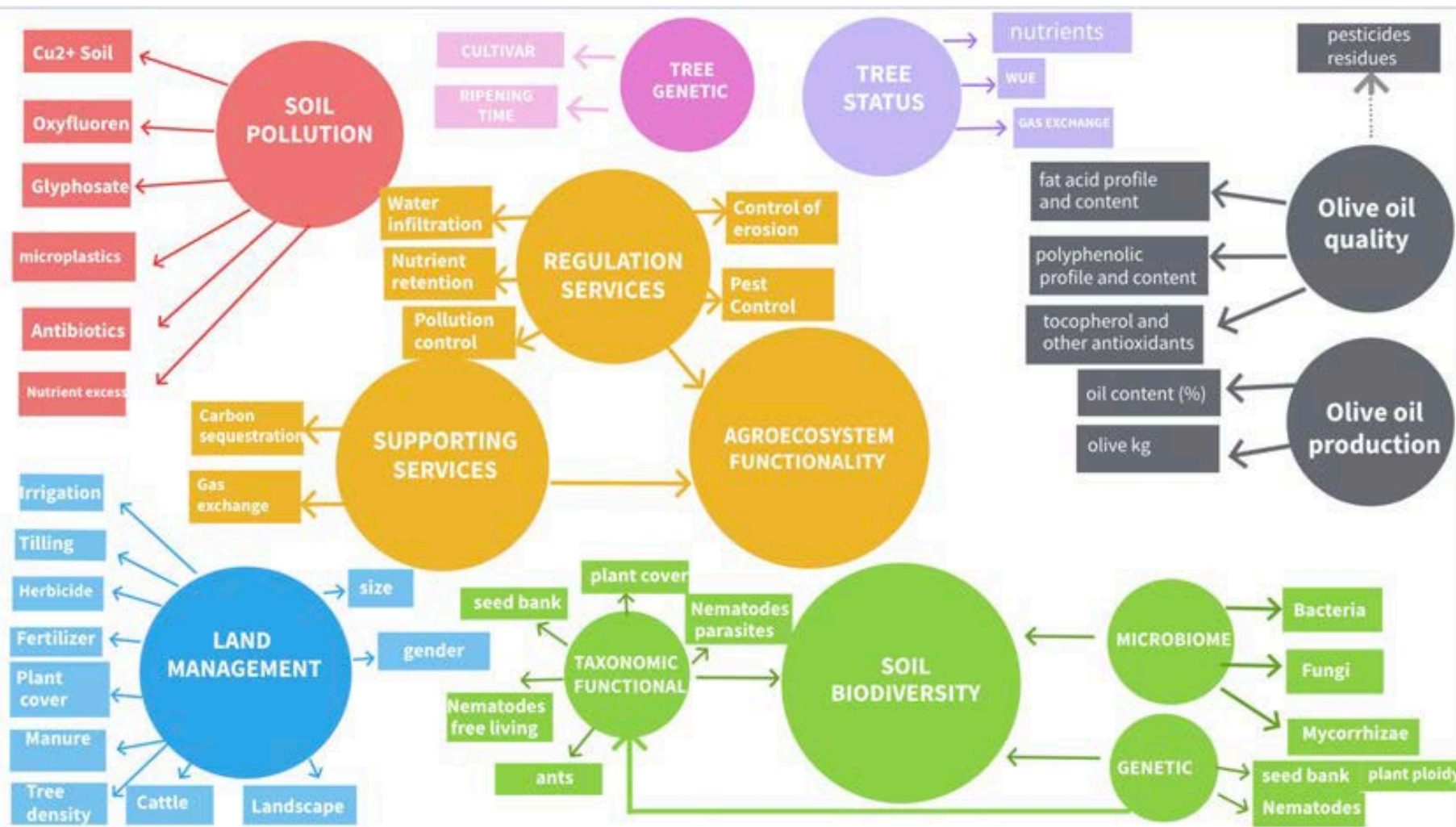


## General Holistic Model: Understanding agronomic drivers of olive quality in Mediterranean Olive groves.

INTERNATIONAL  
OLIVE  
COUNCIL



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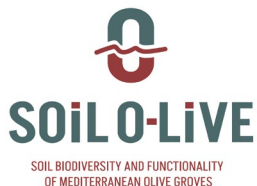
**EVVO**  
It is a natural olive oil that has a free acidity, expressed as free oleic acid, of no more than 0.8 grams per 100 grams and no sensory defects.



INTERNATIONAL OLIVE COUNCIL



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## STAGES

Diagnosis. Pre-operational stage (18 months)

Operational stage. Soil Health Restoration (24 months)

Validation stage. Definition of ecological thresholds (18 months)

## WPs

WP1: Coordination and management

WP2: Soil Pollution

WP3: Land degradation

WP4: Microbiome

WP5: Soil biodiversity

WP6: Ecosystem functioning & Restoration

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# Thank you!

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 [@SoilOlive](https://twitter.com/SoilOlive)

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# EUROPEAN MISSION SOIL WEEK

**DeliSoil project**

**Delivering soil improvers from circular food  
production processes to boost soil health**

**Ansa Palojärvi**

Senior Scientist, Natural Resources Institute Finland



**#MissionSoilWeek #MissionSoil #EUMissions**

## The connection between soil health and food

- **Soil health is tightly linked with**
  - food production
  - food self-sufficiency
  - food quality
  - food safety
- **Healthy soils function well**
- **Soil functions are:**
  - **Primary productivity**
  - **Climate regulation**
  - **Nutrient cycling**
  - **Disease and pest control**
  - **Water regulation and purification**
  - **Habitat provision**

**Healthy soils improve food security by ensuring abundant and high-quality yields in changing conditions.**

**Taking care of soil health is an effective way to mitigate climate change and extreme events that disturb the food production.**



## DeliSoil Project (2023-2027)

**Delivering safe, sustainable, tailored & societally accepted soil improvers from circular food production processes for boosting soil health**

- Call: HORIZON-MISS-2022-SOIL-01-02: Improving food systems sustainability and soil health with food processing residues
- Consortium: 14 partners (incl. Switzerland, Norway), 6 x RTO/ 4 x UNI/ 2 x SME/ 1 x PUB/ 1 x IND

1. Natural Resources Institute Finland (LUKE), Finland
2. Balmes University Foundation (UVic-UCC), Spain
3. Italian National Agency for New Technologies (ENEA), Italy
4. Proman Management GmbH (PROMAN), Austria
5. Mineral and Energy Economy Research Institute of the Polish Academy of Sciences (MEERI), Poland
6. ERINN Innovation Ltd (ERINN), Ireland
7. University of Copenhagen (UCPH), Denmark
8. University of Hohenheim (UHOH), Germany
9. University of León (ULE), Spain
10. Interuniversity National Consortium for Environmental Sciences (CINSA), Italy
11. Yara International ASA (YARA), Norway
12. Finnish Food Authority (Ruokavarasto), Finland
13. Pyhäjärvi Institute, Finland
14. Research Institute of Organic Agriculture (FiBL), Switzerland



 [DeliSoil.eu](https://DeliSoil.eu)

 [@DeliSoil-eu](https://twitter.com/DeliSoil-eu)

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## Delisoil Living Labs and Lighthouses



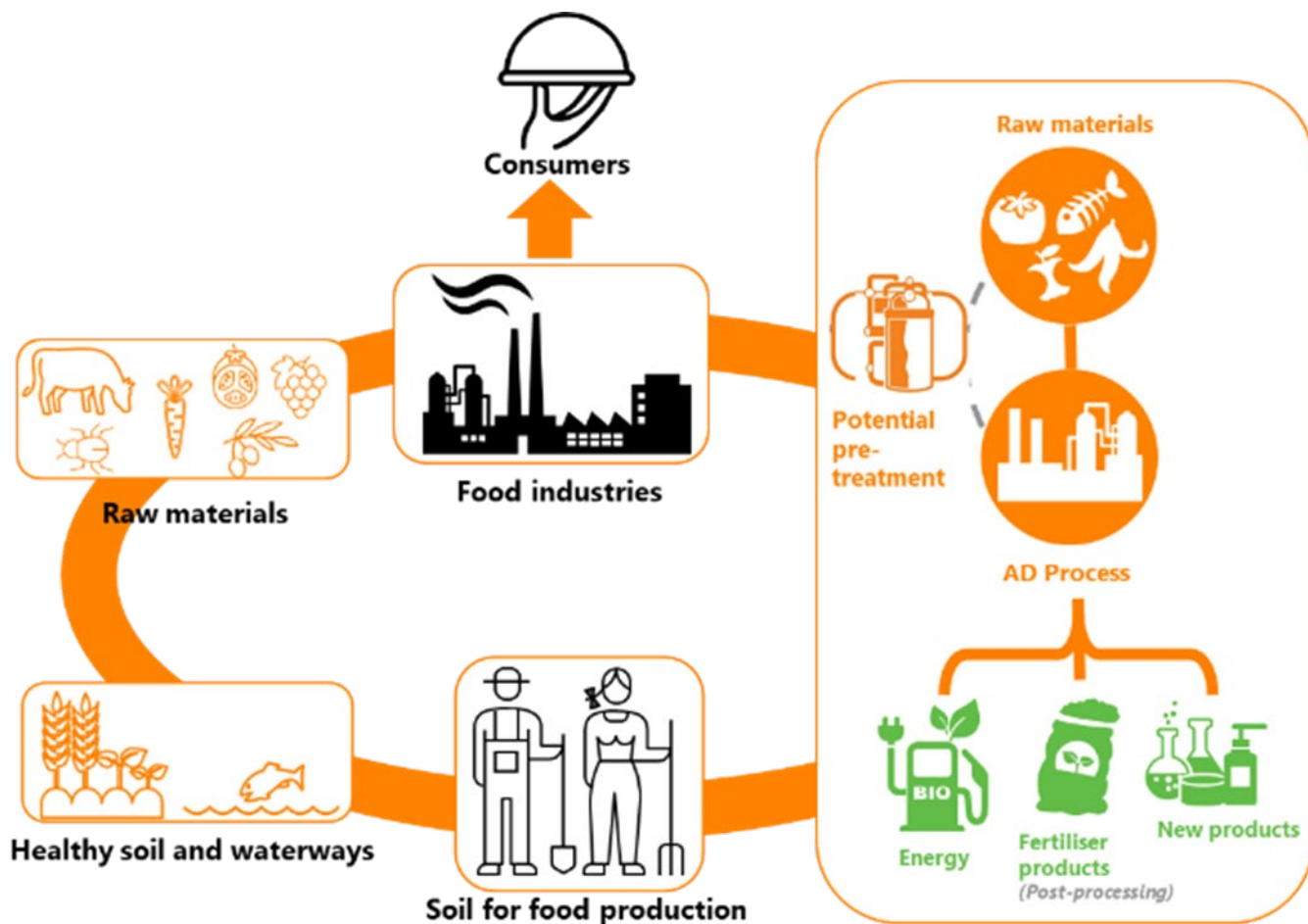
- 5 Living Lab networks of the entire food production value chain actors (boxes)
- 5 Lighthouse places for joint development and co-creation of the processing and use of side streams of food production (\*)

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## Food Value Chain



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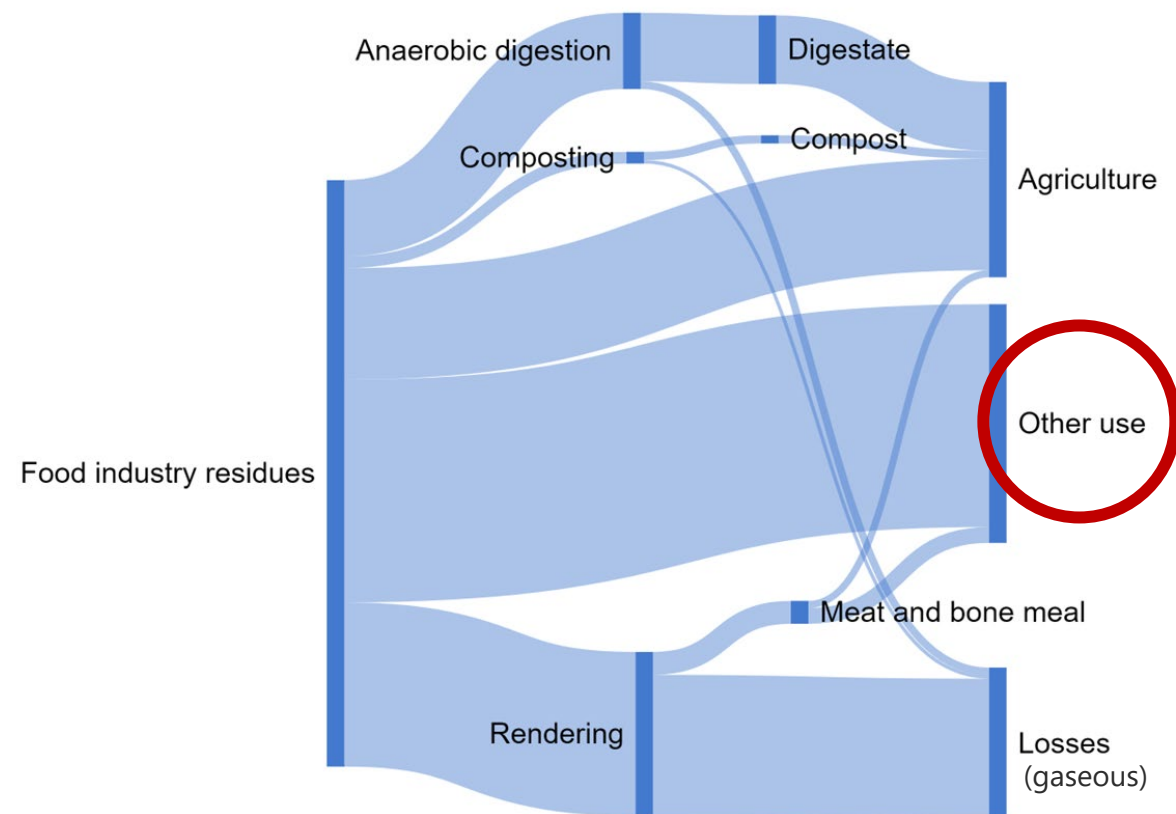
- Food industries produce products to consumers using inputs from the primary production.
- The side streams of the food industry are processed using different technologies, e.g. anaerobic digestion, creating added value
  - both energy and nutrient-rich digestate suitable for fertilizer use
- Side-streams rich in organic matter but poor in nutrients can be used as soil improvers in food production.

## Why food processing side-streams to improve soil health? *Potential to improve recycling – example from Finland, more data needed*

### Sankey chart of estimated food industry side-stream utilization in Finland

The data is based on 390 000 tonnes of side-streams characterised as waste (data for year 2017)

- Potential to increase the use of side-streams, only 30% used in agriculture, 40% in other end-uses, and 30% lost during processing (e.g. evaporation)
  - Other uses consist of e.g. use in landscaping and bioenergy
  - Also, part of the water lost could be recovered and recycled back to food production



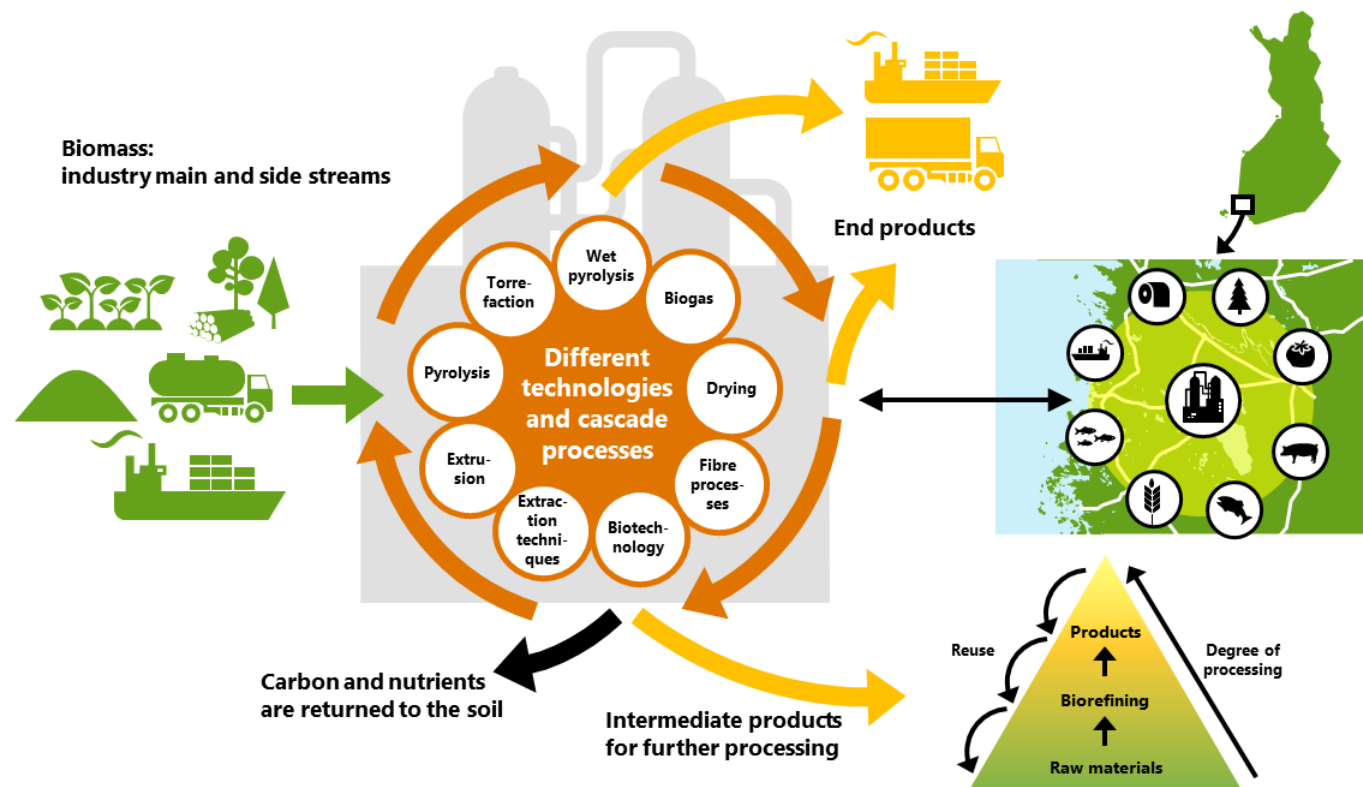
## Circular bioeconomy and cascade vision

Cascade processing is an enabler towards transition to a circular bioeconomy

Cascading use of biomass would follow a movement down the bio-based value pyramid, going from higher- to lower-value biomass applications.

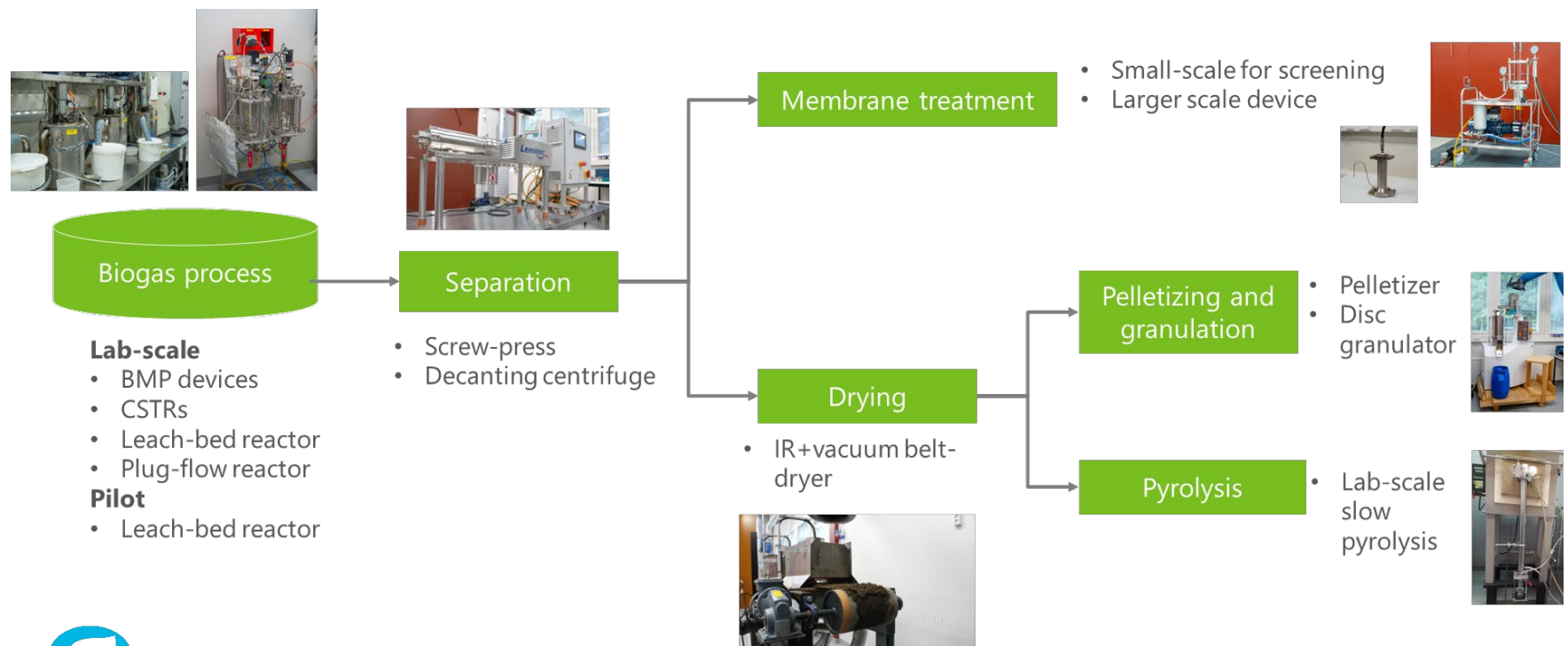
Cascade processing = Sequential processing technologies capable to convert biomass into end products and services without creating waste streams

$$\begin{array}{c}
 \text{Regional biomasses} \\
 + \\
 \text{Processing technologies} \\
 + \\
 \text{Local actors} \\
 = \\
 \text{Regional circular bioeconomy}
 \end{array}$$



## Biopaja Lighthouse at Luke, Jokioinen

### Available technology chain to produce fertilizer products from side-streams



## DeliSoil in a Nutshell

**DeliSoil** develops solutions for the treatment and recycling of side-products from the food industry, while preventing environmental risks and improving soil health.

The side-streams of the food industry have a great utilization potential because they are generally safe and of uniform quality and are locally concentrated.

**DeliSoil** promotes the goal of the EU fertilizer regulation to bring safe and high-quality recycled fertilizer products to the market, as well as the EU's mission "Soil deal for Europe" and the EU's "Farm to fork" sustainable farming strategy.

Regional **Living Labs** has been established together with stakeholders from the entire food value chain. In connection with them, there are **Lighthouse** sites intended for joint development and ideation, e.g. in Finland Luke's Biopaja.

Innovative solutions are tested and shared using side streams from several regionally important food industry sectors, and the results are widely communicated.



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# Thank you!

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[delisoil.eu](http://delisoil.eu)

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# EUROPEAN MISSION SOIL WEEK

The BIN2BEAN project

**Sara Daniotti**

Consorzio Italbiotec, Head of Bioeconomy PM Unit

21/11/2023



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## The benefits of food and bio-waste for healthy soil

- There are two main types of soil improvers that can be obtained from bio-waste (**digestate** and **compost**) while new options are also appearing in the sector (e.g. biochar)
- The positive effects on soil properties include: increased **water retention**, increased **nutrient content** (nitrogen and phosphate), increased **carbon sequestration**, helps to reduce erosion, improves the biological activity of soils.

→ Can compensate for lack of fertilizers thus increasing food production.

**34 million tons of CO<sub>2</sub>**  
equivalents  
sequestered  
in soil annually

If all organic waste produced globally were collected and converted in compost

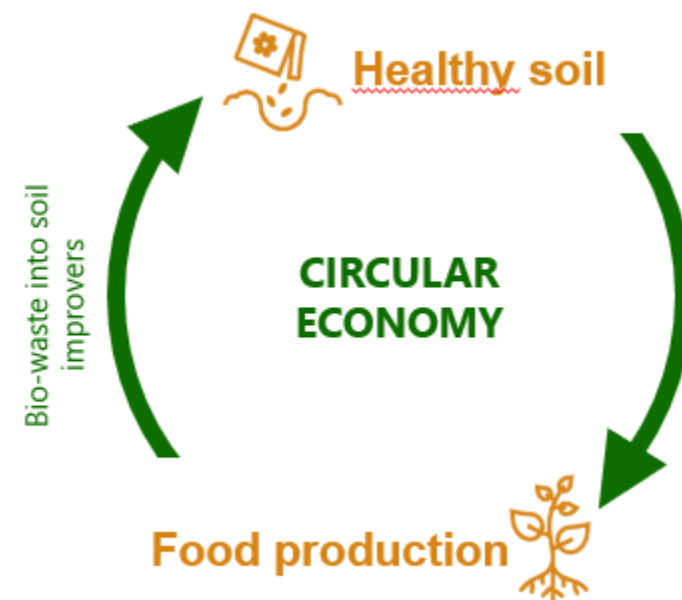
**Increase water capacity by 3.8 L** of water over 1 m<sup>2</sup> of soil

Compost applied at a rate of 30 tonnes per ha per year over 20 years

**9,25kg of nitrogen & 3,4kg of phosphate** per ton of compost

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## The struggle to reach the market is real!

**80%** of EU biowaste are currently **landfilled or incinerated**.  
**Only 17%** of municipal waste is **composted or digested** in the EU

### Limitations include:

- Regulatory barriers for the application of soil improvers obtained from bio-waste
- Low quality standards of the soil improvers (low harmonization of the standards and the analysis carried out)
- Low stakeholder acceptance
- Low efficiency of the collection system

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WEEK

## Boosting the market deployment of safe, effective and sustainable innovations for soil improvement from bio-waste, towards regenerative soil systems

The general aim of the BIN2BEAN project is to help EU cities meet EU targets and objectives in their transition to healthy soils and soil regenerative systems, by **optimising bio-waste recycling into soil improvers** through innovative and economically viable value chains

### Project specific objectives:

- To support **3 cities** in restoring their soils from bio-waste
- To develop an **improved evaluation framework** for soil improvers from biowaste
- To **compare existing solutions** for the market uptake of the best performing
- To develop and pilot 12 **business models** on innovative solutions for the production of soil improvers from biowaste
- To **support policymakers** in boosting local regenerative soil system

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WEEK



Start date: 1 September 2023  
Duration: 36 months  
Nr. of partners: 11  
Coordinator: Consorzio Italbiotec (IT)

## The BIN2BEAN project concept



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## Project Living Labs: Amsterdam (The Netherlands)



### Status:

- The separate collection of organic waste has evolved in the last years (district4district approach in 2020)
- Objective to reach 100% circular city in 2050

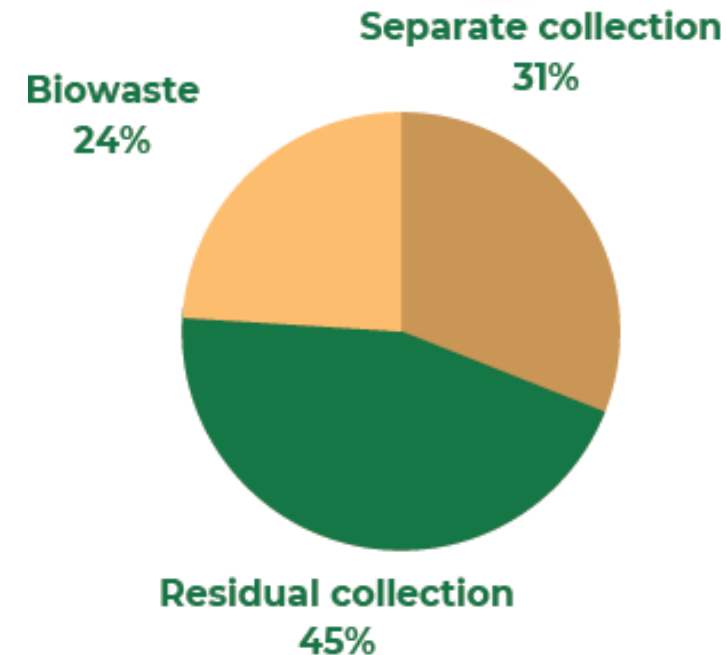
### Challenges:

- The district4district approach needs adaptation of different collection systems per each district
- Valorization options depend on OW quality -> interaction with collection system is needed to improve valorization

### Objective of the LL:

- Test and implement a new OW collection system via grinder for the new district Havenstad (high-rise building)
- Improve the quality of OW collected -> high-quality valorization

## EUROPEAN MISSION SOIL WEEK



358 kg of waste per person per year

## Project Living Labs: Hamburg (Germany)



### Status:

- Biowaste is collected separately via a door-to-door collection. Additionally, people can bring their biowaste (bushes, grass, pruning etc.) to a recycling yard
- Biowaste is treated in biogas and composting plan

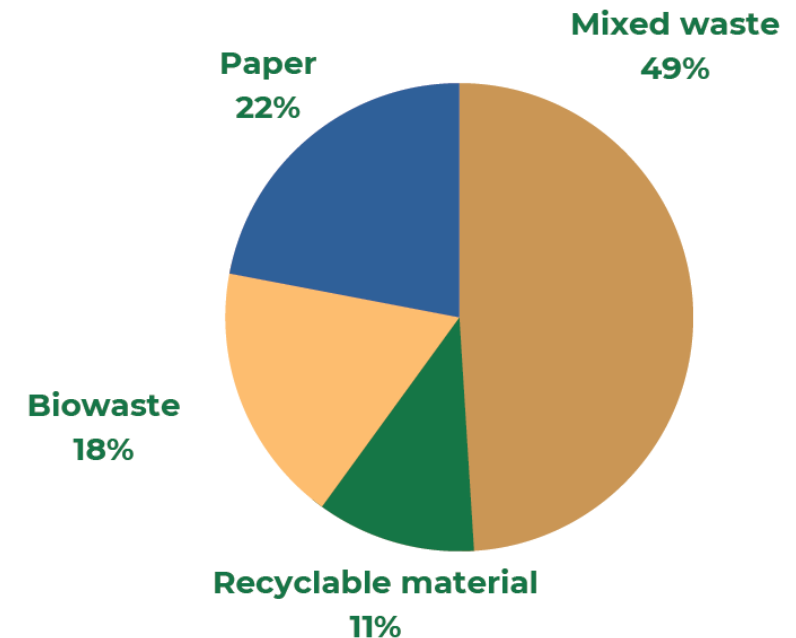
### Challenges:

- Residual waste still contains 40% of OW
- Lot of impurities (e.g. biodegradable plastic bags, garden waste)

### Objective of the LL:

- Improvement of biowaste collection (quantity and quality)
- Focus on a anaerobic digestion system to produce soil improvers
- Different solutions proposed (also at social level -> training, information campaigns)

## EUROPEAN MISSION SOIL WEEK



80.000 tons of bio-waste collected per year

## Project Living Labs: Egaleo (Greece)



# EUROPEAN MISSION SOIL WEEK

### Status:

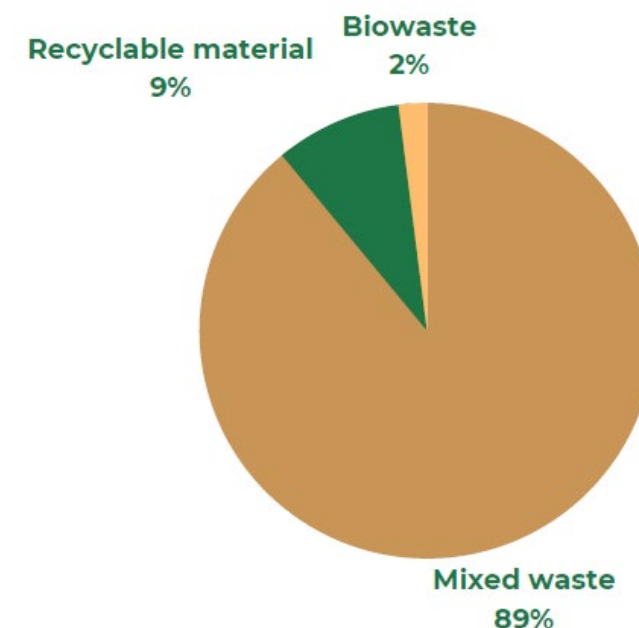
- Transitional stage with regards to bio-waste management
- Only 2% of the collected waste are bio-waste

### Challenges:

- Gap of knowledge in the public sector with regard to bio-waste management and to improve the municipal soil using bio-waste
- Scarce citizens awareness

### Objective of the LL:

- increase the % of bio-waste collected and recycled with a focus on underground collection system;
- Attract citizens on the topics and work with local markets;
- Demonstrate different ways of compost application to restore a small forest and other green urban areas.



40.000 tons of waste per year

## Project results for the cities and the local operators

- **Toolbox with roadmaps and guidelines:** Toolbox guiding cities towards the implementation of the BIN2BEAN approach, including a roadmap on the sequencing and use of BIN2BEAN tools and guidelines on high-quality and efficient bio-waste collection and recycling, on safe and sustainable production and use of soil improvers and on maximizing the market uptake and economic viability of the most virtuous solutions.
- **Scoring system as a decision-making tool:** computing the overall performances of regenerative soil systems solutions, by combining a set of evidence-based indicators (technical, socio-economic and marketability).
- **App for end-users to select the best soil improver (<https://www.farmmaps.net/en/>):** End-users will be able to provide information on their soils and soil improver(s) of their preference, and the app will then provide, through the set of Indicators developed by BIN2BEAN, the effects on soil health end-users may expect. 3 soil improvers maximum per LL will be considered to enter the platform.



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# Thank you!

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