

22/10/2024

New Life for Biowaste as a sustainable Soil Improver

Webinar – How to valorise biowaste
By Miriam Romero from

inveniam  . .



Disclaimer

“Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.”



**Funded by the
European Union**

Fenix at a glance

Title

New Life for Biowaste as a sustainable Soil Improver

Duration

50M

Partners

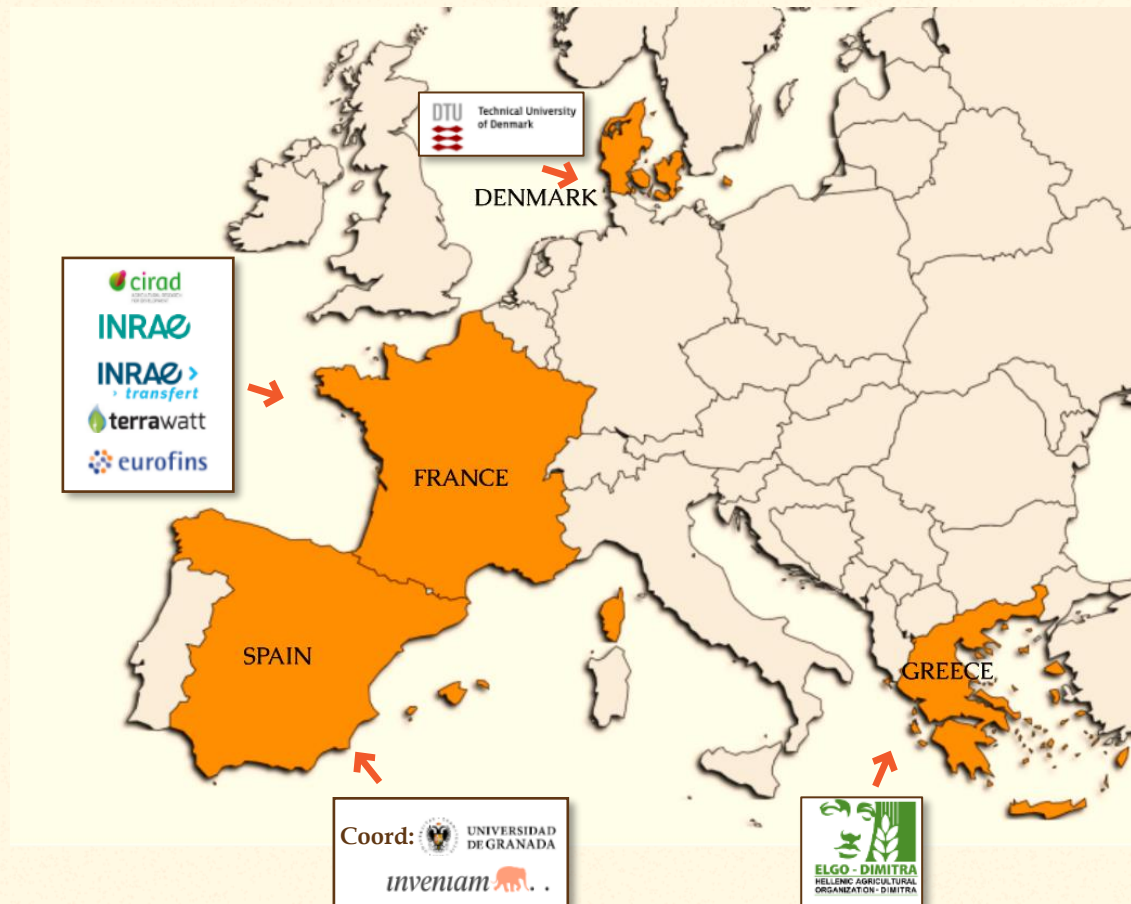
9 partners

Budget

Grant: 2.8 M€

Funding Scheme

Horizon Europe



Start
June
2023

M17



End
July
2027

Context

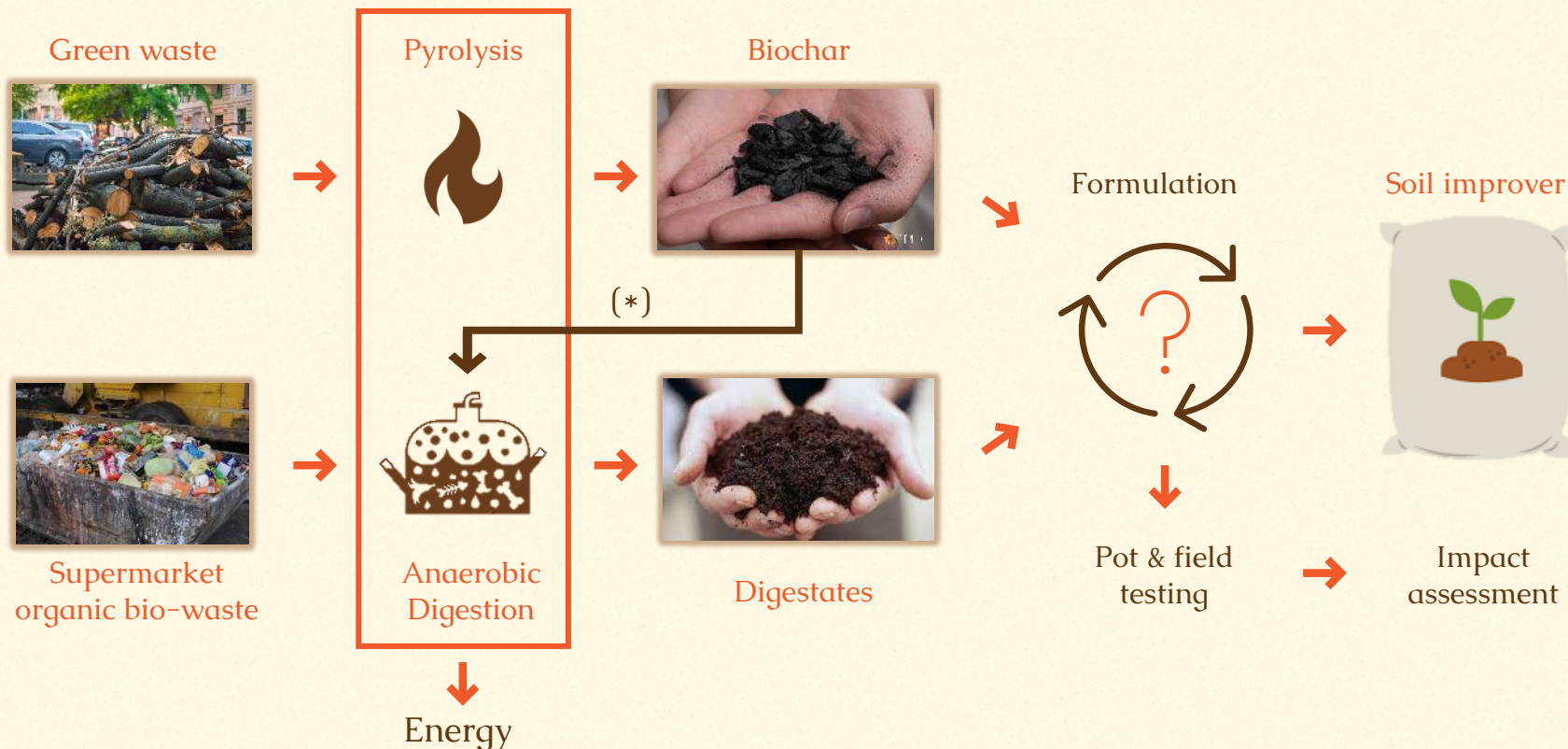
- **Poor bio-waste valorization:** 34% in Europe (EU target 65% by 2035)
 - Current options: for energy purposes or composting
- **Bio-waste transformation potential:**
 - **Non-fermentable: biochar**
 - Enhance soil water-holding capacity, nutrient uptake, and soil fertility.
 - Stimulates microbial activity and diversity in the soil
 - Act as carbon sink
 - ☹ ○ **BUT:** agronomic benefit remains untested
 - **Fermentable: digestates**
 - Obtained from AD process for biomethane (energy) production
 - Source of nutrients essential for plants
 - ☹ ○ **BUT:** barriers on the expansion of AD plants due to cost disposal of effluents (digestates) and feedstock heterogeneity. Must be applied fresh.

FENIX objective

Contribute to the **recovery of abandoned poor soils** for the agriculture, increasing EU's soil quality and water retention capacity, while also contributing to **climate change mitigation**, secure an **independent energy supply**, and a **sustainable bio-waste management**.



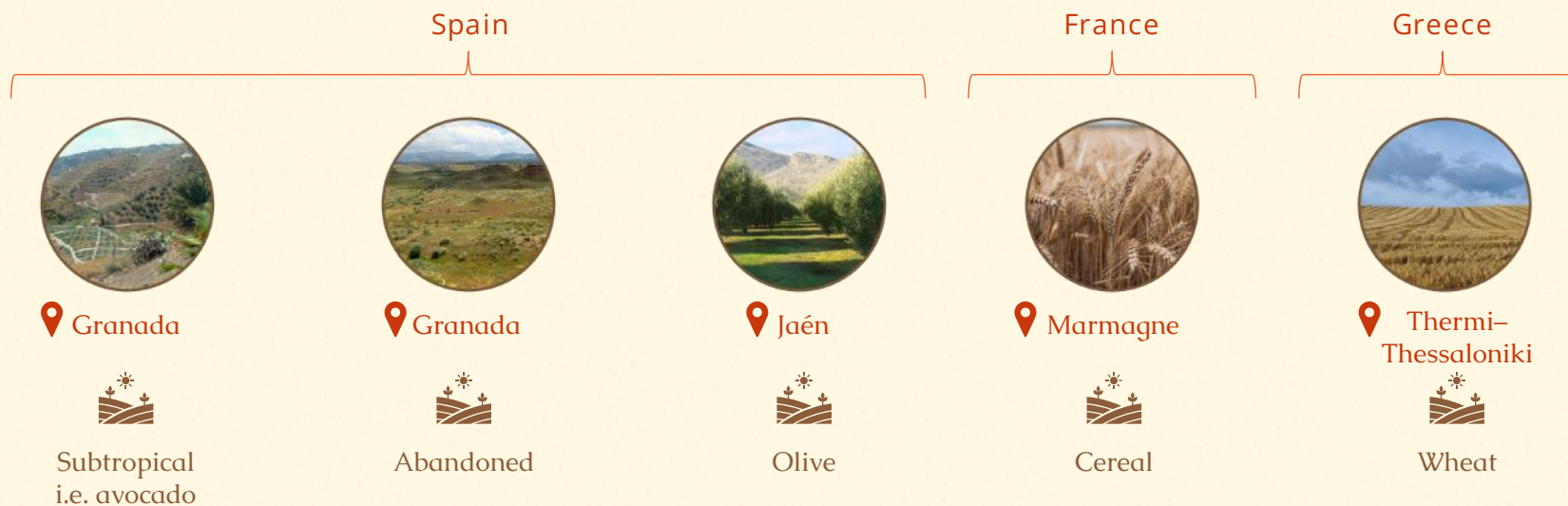
But how are we going to do that?



(*) Prove the synergies between pyrolysis and AD by adding biochar into the AD process to increase biogas production

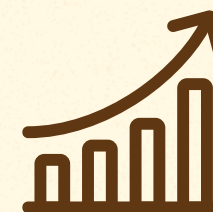
FENIX step by step

- 1 Produce the biochar at lab scale using different green waste residues and production parameters
- 2 Select the 4 best biochar targeted to soil application and improvement
- 3 Test different mixtures of digestates-biochar in pot test on different soil type to assess their effect
- 4 Select the 4 most promising and test them in field conditions to assess changes in soil properties



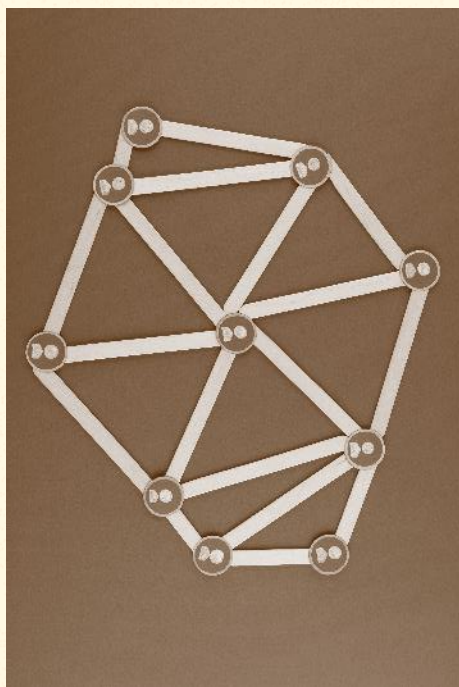
In addition...

- 5 Characterize gaseous emissions and organic nitrogen mineralization potentials of the soil improver to develop computer simulation and decision-making tool.
- 6 Test biochar as an additive to enhance microbiological activity in anaerobic digestion



The outcomes & impacts

New improved and demonstrated products, value chains and services available for soil improvers derived from bio-waste.



Development of an alternative soil improver to show the agronomic benefits of switching from traditional chemical products



Improve and demonstrate product and production process efficiency of soil improver produced out bio-waste



New value chains creation integrating waste management companies, biochar and fertilizer producers, through the manufacturing of soil improvers at pilot scale (TRL6-7).

The outcomes & impacts

Improved environmental, health and safety performance of soil improvers from bio-waste and related production operations, including improved testing methods throughout the entire life cycle.



Improve the soil quality

- Acid/carbonate reaction,
- Increase of soil microbial biomass and total nematode
- Fungal biomass,
- Bacterial biomass,
- Soil organic carbon content



Demonstrate ability to avoid and even sequester GHG emissions (CH₄, CO₂ and N₂O)



Development of a long-term effect simulation tool.



Regulatory roadmap to reduce future regulatory barriers and ensure environmental, health and safety compliance with EU or national regulation

The outcomes & impacts

Improved nutrient recovery from bio-waste for soil improvers production.



Improve bio-waste recycling, reducing waste sent to landfill by defining new and more profitable value chains



Enhance efficient recovery of nutrients from bio-waste for soil application



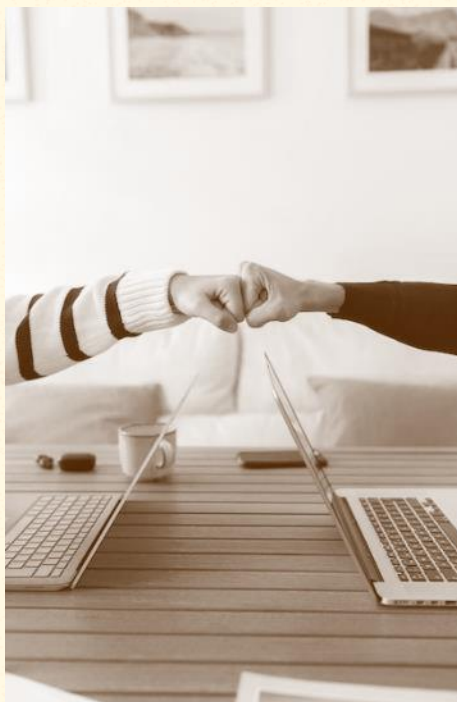
Increase AD and pyrolysis processes economic viability through valorisation of by-products (biochar and digestates)



Improvement of the digestates stability and ability to retain water and nutrients avoiding its degradation during transport and storage time thanks to its combination with biochar.

The outcomes & impacts

Enhanced entrepreneurship on circularity and regenerative processes



Creation of spin-off companies or joint ventures participated by partners and promote collaboration agreement between academia and established agronomical companies.

→ *FENIX Business Platform*



Look for synergies between the best way on recovering green waste (AD and pyrolysis), for production of soil improvers and biogas.

Thank you



-  info@fenix.com
-  project-fenix.eu
-  FENIX Project EU
-  @Fenix_ProjectEU

inveniam  . .