



**Transforming bio-waste into  
safe and effective soil  
improvers**

**Joint webinar 22<sup>nd</sup> October 24  
How to valorise biowaste?**



Funded by  
the European Union

# Soil degradation Global emergency

- 60 - 70% of EU soils are degraded due to unsustainable
  - unsustainable exploitation and
  - disproportionate use of chemicals.
- Expected to increase in the coming years due to climate change, increased land use and unsustainable practices linked to human population growth.





- **Soil improvement products** are inputs that are added to the soil in situ and whose main function is to maintain or improve its physical, chemical and/or biological properties.
- Many of the soil products applied today to maximise agricultural production, such as fertilisers or herbicides, contain synthetic chemicals.
- **On 16 July 2022, the new Regulation on fertiliser products, Regulation (EU) 2019/1009**, entered into force, which aims to reduce the use of synthetic products and to set more restrictive requirements for the marking of synthetic products.





**How to fight against soil degradation?**



**biowaste valorisation pathways**



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# Fertilisers from biowaste

•The aim of the SOILUTIONS project is the implementation of innovative and effective fertilisers, produced from organic waste, that fosters the recovery of soil quality and fertility through the reduction of the use of chemical fertilizers, as well as the circular economy by reduce organic waste that is incinerated or sent to landfill.

•In essence, it will address soil degradation and the reduction of organic waste in the city and surroundings. Everything will be done in a co-creation process where the development of the circular economy and the entrepreneurial system participation will be essential parts.

•SOILUTIONS aims to address this issue by building on and taking forward previous key EU Projects involving key consortium partners, the main ones being WaysTUP! (SAV-Coord., DRAXIS), VALUEWASTE (CETENMA-Coord., NuReSys, GAIKER and ENTOMO) and Scalibur (CSCP and G!E).



Missions  
València 2030

# The consortium










11 partners & 1 affiliate entity

4 countries



4 Coordinators and partners from the main EU Projects regarding biowaste



## The project Begins

- 4 years
- Kick-Off meeting - September 23





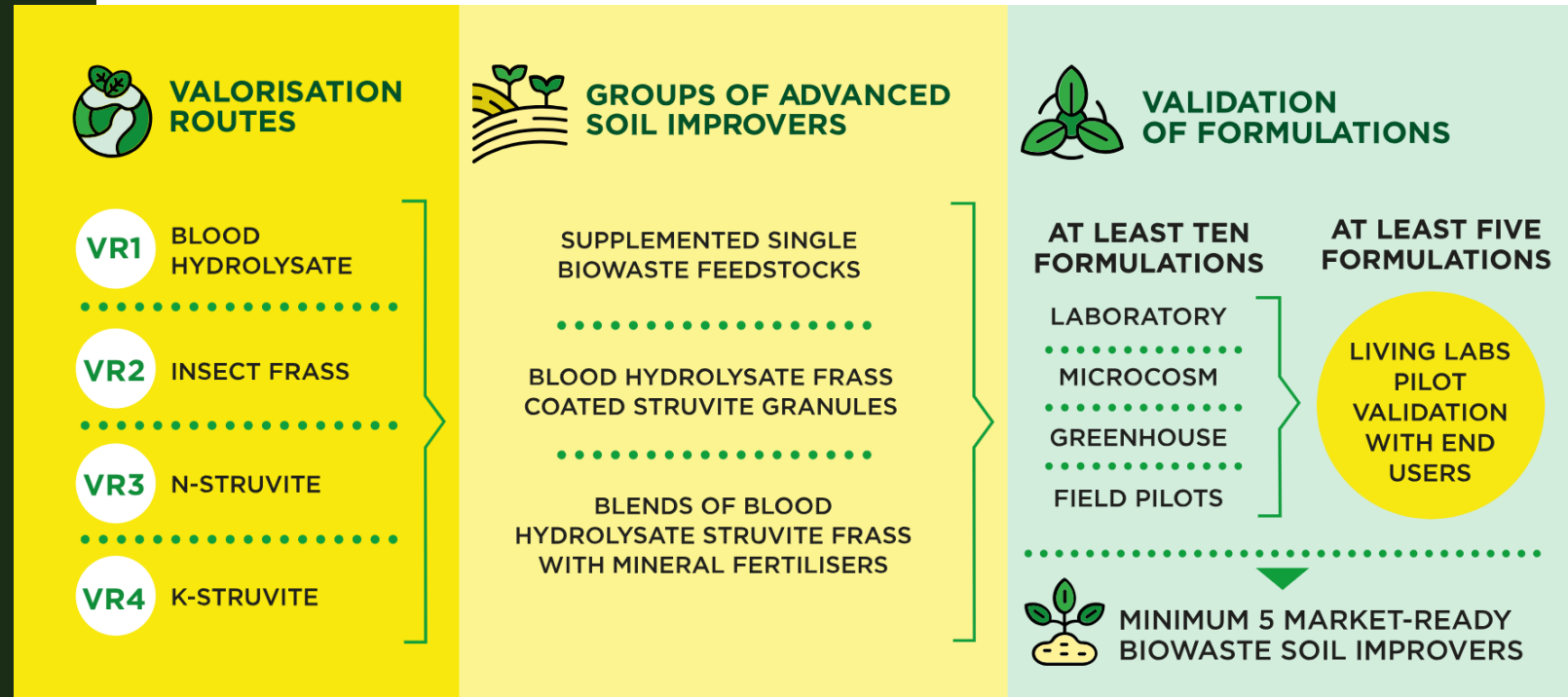
# Valorisation paths

•4 biowaste valorisation paths optimization:

- Insect Frass
- Blood Hydrolysate
- N-struvite
- K-struvite

•To produce advanced fertilizers aiming to improve nutrient recovery from biowaste (e.g., N, P, K, organic matter) and reduce landfill and incineration.

•These biowaste feedstocks will be combined in different formulations along with key additives (e.g., non-microbial plant bio-stimulants, microbial plant bio-stimulants and controlled nutrient release coatings, to generate at least 5 soil fertilizers.





# Valorisation paths

## 1. Blood Hydrolysate:

Following-up WaysTUP! research activities for process optimisation to 400 l/week enzymatic hydrolysis.

BIOSOILUTIONS will develop new blood hydrolysate soil improvers with high Fe and N contents and 80% L- aminoacids recovery for direct soil uptake.

## 2,-Insect frass from insect fed with solid urban waste/solid industrial waste/digestate

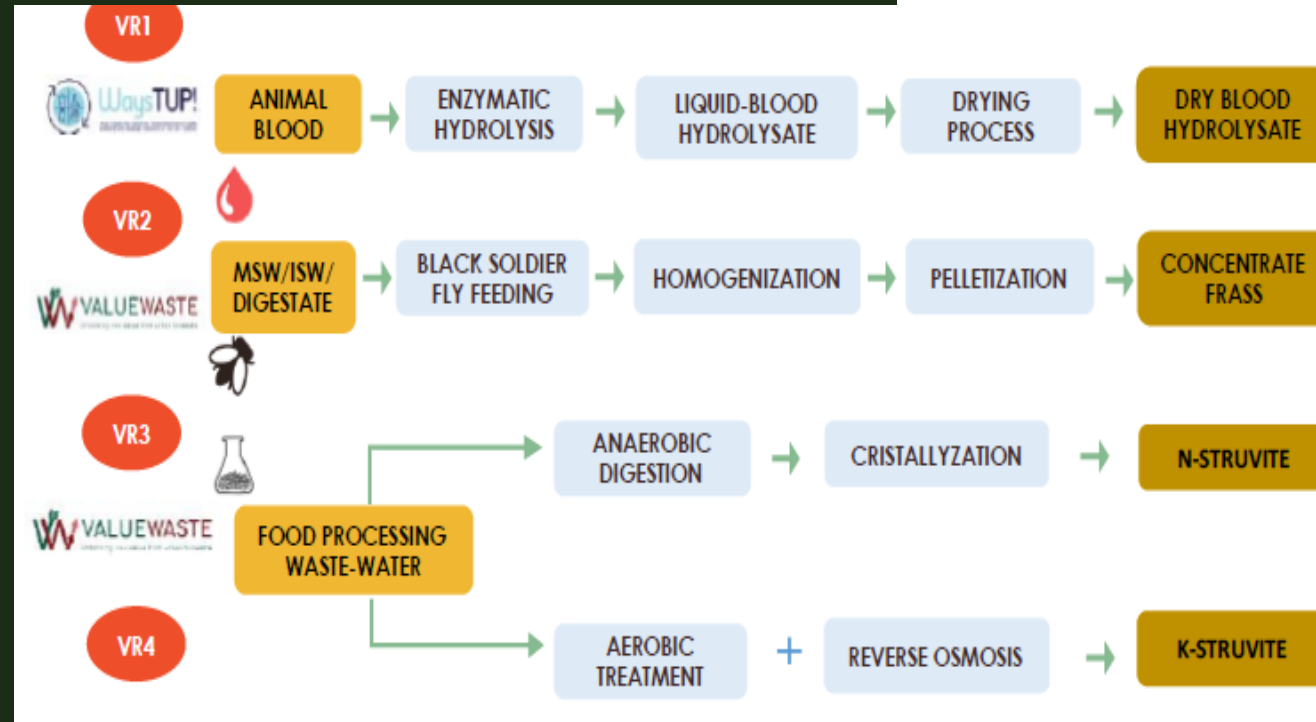
Following-up VALUEWASTE research activities for pilot scale (50 kg/h) frass separation from non-required materials (insect parts), heat stabilisation and homogenisation will enable regulatory compliance and concentrate key components for soil recovery (e.g., chitin, NPK, growth promoting bacteria) resulting in more effective soil improver properties.

## 3,-N-struvite from food processing wastewater

VR3 will follow-up VALUEWASTE research activities. N-struvite from bio-waste is a potential soil improver rich in phosphorus (up to 80% recovery of the soluble P from bio-waste) obtained through anaerobic digestion of different bio-wastes. Struvite will be produced at 1m3/h.

## 4,-K-struvite from food processing wastewater.

VR4 will follow-up VALUEWASTE research activities anaerobic treatment and reverse osmosis of food processing wastewater from potato processing will be optimised at pilot scale production providing 1m3/h of wastewater processed to obtain K-struvite, with the consequent P and K recovery from bio-waste.



# Validation

## Laboratory

Effective Organic Carbon (EOC) to estimate organic matter mineralization on soils.

## Microcosm

Growth parameters (e.g., height, number of leaves, SPAD index), aerial and roots biomass, and N, P and K, Effective Nitrogen availability for plant uptake to evaluate soil mineralisation dynamic.

## Greenhouse

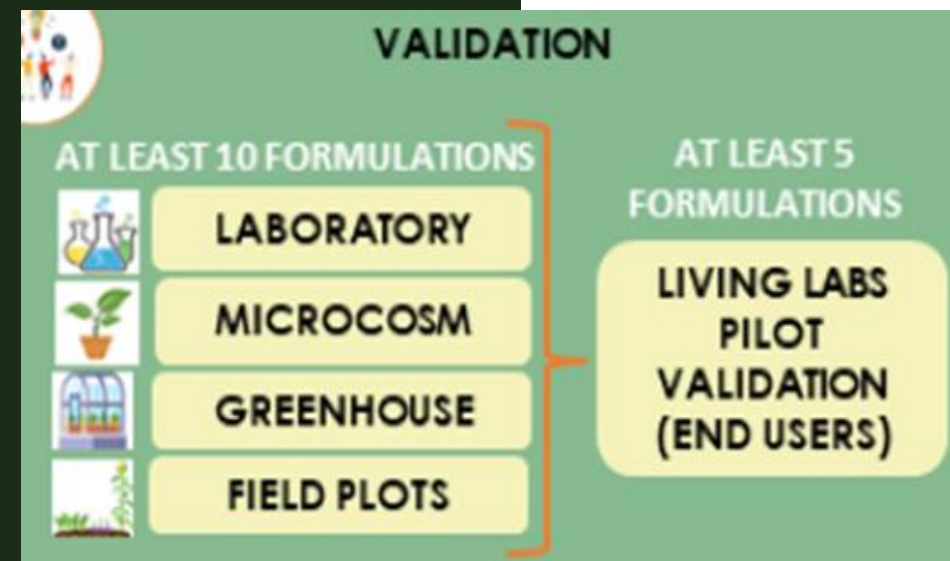
Crop phosphorus dynamics to assess nutrient use efficiency of P.

## Field plots

Crop Nitrogen Balance to estimate potential N supplies and GHG exchange to evaluate environmental impact.

## End-user pilot validation

Substitution of usual products with bio-waste soil improvers (5 formulations). Crop performance will be evaluated (e.g., yield, biomass production, ease of application, potential issues) by at least two end-users in each of the SLL locations (Flanders, Valencia, Murcia).



# 3 Living Labs development in Europe

- Flanders (Belgium)
- Valencia
- Murcia

•Co-creation and co-validation spaces for the development of soil bio-improvers involving the stakeholders of the entire value chain

•The Valencia Living Lab will match with the European Green Capital of the city of Valencia and will be in line with the Municipal 2030 climate mission.

Flanders

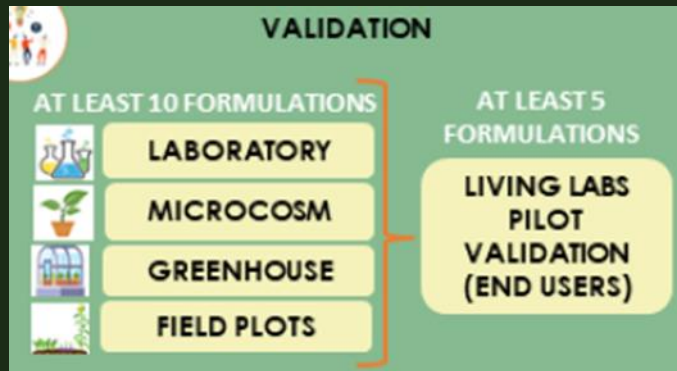
Valencia

Murcia



# Results and data

- At least 5 fertilisers
- Validated data obtained from the optimization of the process from all the valorization paths
- Techno Economic analysis from every process

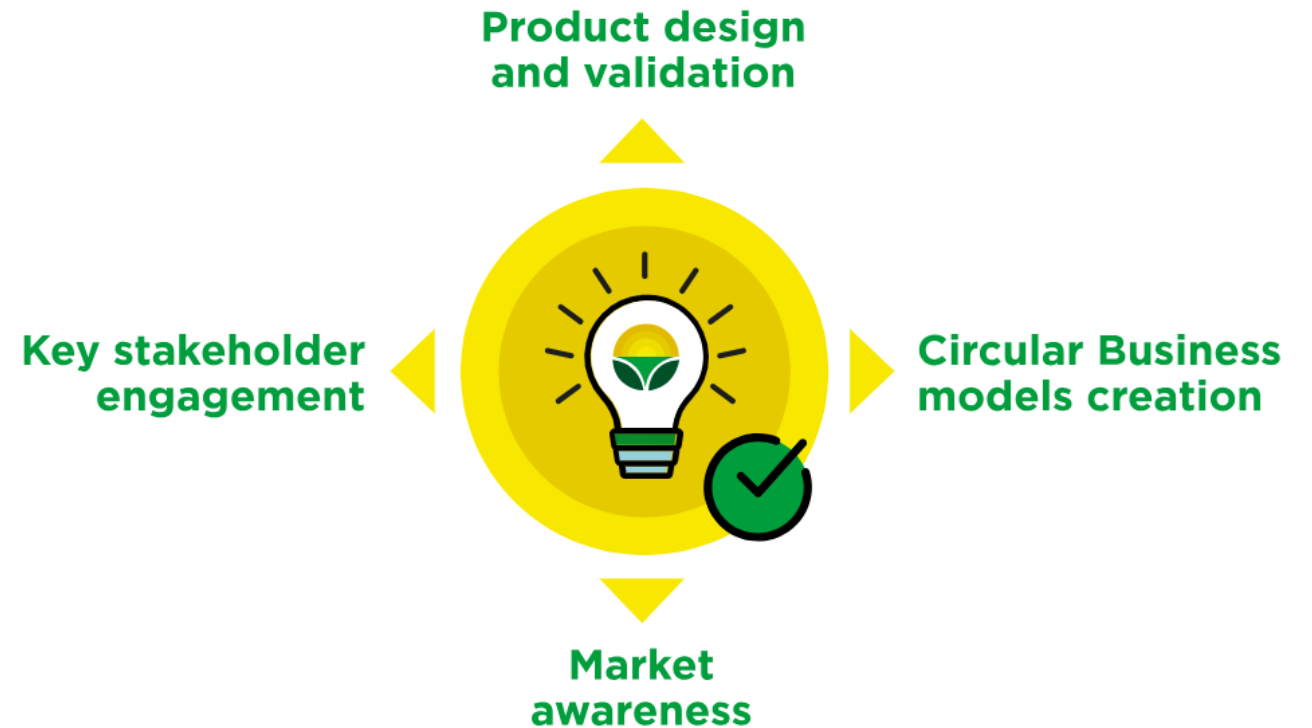


**MINIMUM 5 MARKET READY BIO-WASTE SOIL IMPROVERS**



# Concept

•The SOILUTIONS project aims to accelerate the placing on the market of fertilisers obtained from the valorisation of organic waste, in order to reduce the use of chemical fertilizers, promote sustainable soil recovery and improve the circularity of the entire system.



# Thank you for your attention

*The SOILUTIONS project is 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 or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.*

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