



SUPREME – ERANET MED project

developping tools for SUsustainable food PRoduction in mEditerranean area using MicrobEs



Agricultural Research Institute
Ministry of Agriculture, Rural Development and Environment

SUPREME ERA NET MED 2

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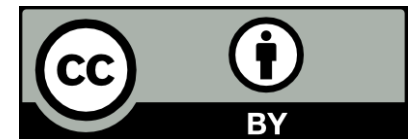
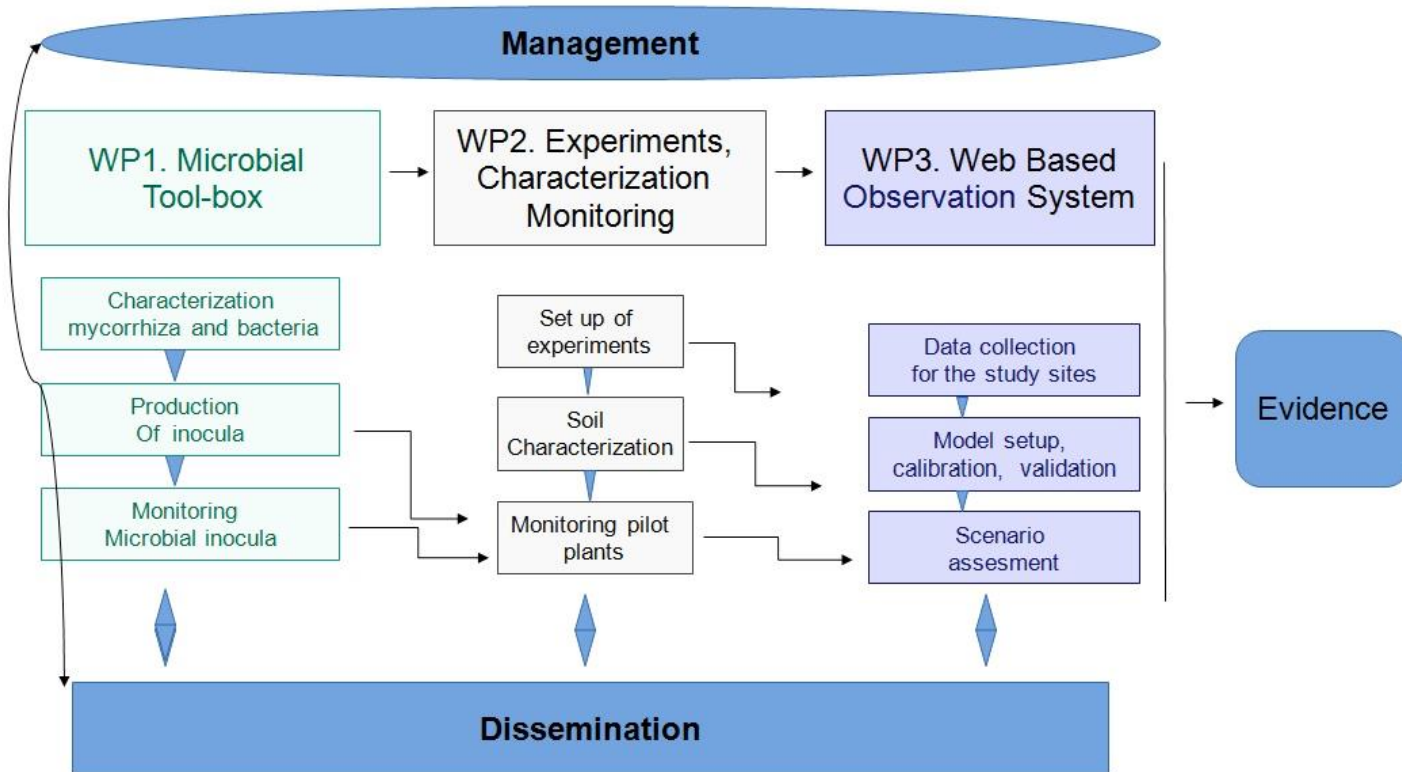
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- **Objectives :** - set up of a sustainable agricultural production frame, addressing vulnerable communities living in semi-arid and arid areas in the Mediterranean - combat impoverishment of soils and reduce the use of water, fertilizers, and pesticides by means of microbiome potential to stabilize soil and promote plant growth
- **Initial TRL :3 - Final TRL:6***
- **Scientific and technical barriers/challenges:** integration of state-of-the-art biotechnologies and leading edge characterization, monitoring and modeling tools, accessed through an innovative, interactive web-based observation system





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Results expected

- **selecting what microbial fertilizer inocula, when, where and how to use them**
- **assessing sustainability over 30 years based on characterization and modelling**
- **reducing the water demand and fertilizer (per)use in agricultural practices in the Mediterranean area**
- **creating a co-production frame between researchers, farmers and policy makers, which aims at bridging the gap between research, real needs and policy aims.**





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Soil sampling before field experiment



Mineral	TS1	TS3	TS6	TS8	TS1 Clay	TS3 Clay	TS6 Clay	TS8 Clay
Quartz (Qz) SiO_2	✓	✓	✓	✓	✓	✓	✓	✓
Albite (Ab) $\text{NaAlSi}_3\text{O}_8$	✓	✓	✓	✓				
Microcline (Mc) KAlSi_3O_8		✓	✓	✓				
Muscovite (Ms) $\text{KAl}_2(\text{Si}_3\text{Al})\text{O}_{10}(\text{OH},\text{F})_2$	✓				✓	✓	✓	✓
Anorthoclase (Ano) $(\text{Na},\text{K})\text{AlSi}_3\text{O}_8$		✓						
Kaolinite (Kln) $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$					✓		✓	✓
Illite (Ilt) $\text{K}_{0,65}\text{Al}_{2,0}[\text{Al}_{0,65}\text{Si}_{3,35}\text{O}_{10}](\text{OH})_2$		✓						
Montmorillonite (Mnt) $(\text{Na},\text{Ca})_{0,3}(\text{Al},\text{Mg})_2\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot n(\text{H}_2\text{O})$						✓		
Phlogopite (Phl) $\text{KMg}_3(\text{Si}_3\text{Al})\text{O}_{10}(\text{F},\text{OH})_2$			✓	✓				



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Laboratory step for characterizing microbes and soils



Al- Ghweir
Jordan field site

barley plants
grown with only
water and
without
fertilizer

barley plants
grown with
bacteria inocula
without
fertilizer

barley plants
grown with only
fertilizer





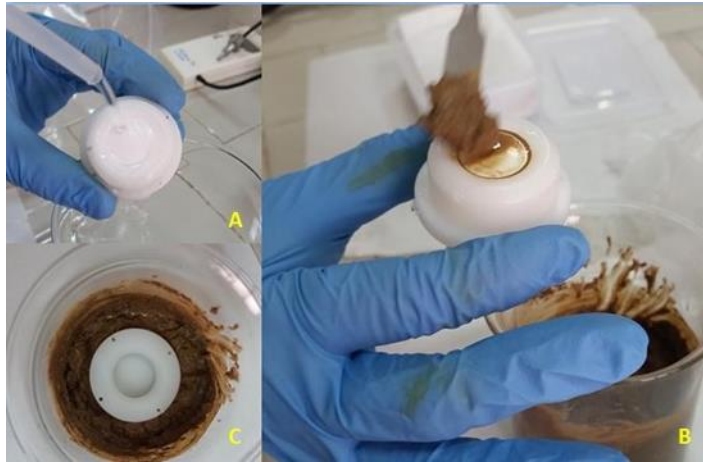
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Measuring nutrient bio availability with and without inocula

DGT devices



Concentrations in DGT

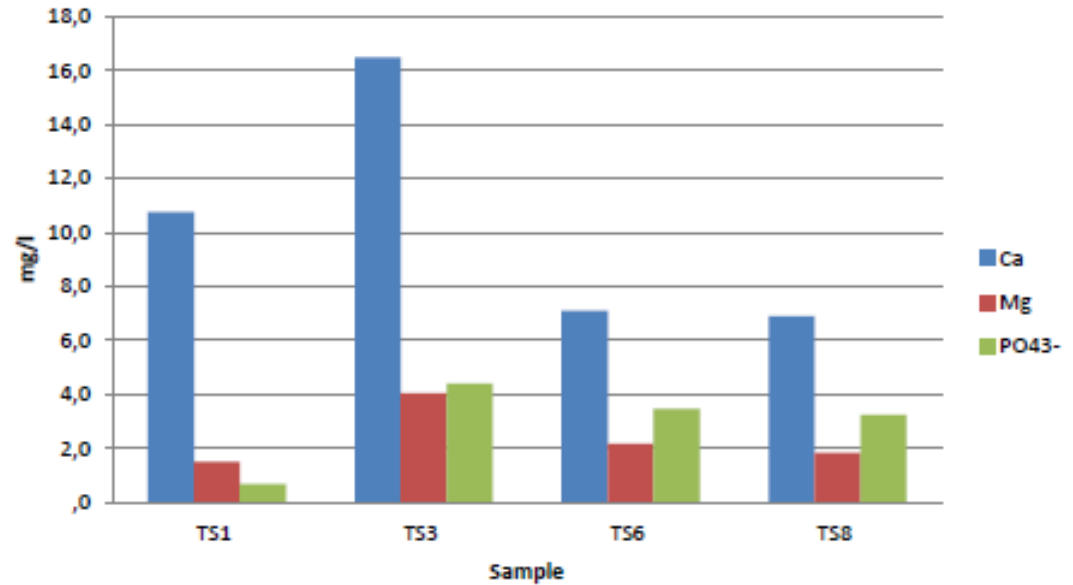


Figure 1. Nutrients trend extracted by DGT, in the analyzed soil samples.





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- Pula (Sardinia) pilot experiment is on
- actually tomato plant are productive
- The first in situ experiment last this July
- Excellent products.. next year we do more
- Many questions will be answered from July
- Stay tuned

