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ReCROP : Bioinocula and CROPPing systems: an integrated biotechnological approach for improving crop yield, biodiversity and REsilience of Mediterranean agro-ecosystems

Poster

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Abstract

The Mediterranean economy is highly dependent on agriculture. However, agricultural sustainability and productivity in this region is under serious threat due to climate change and the depletion of water resources. This is worsened by poor management practices, such as the overuse of chemical fertilizers, pesticides, overgrazing and monoculture farming. Recent climate change models indicate that European and Northern African regions will undergo extreme climatic events throughout the year, this will negatively impact crop yield and productivity. Summer droughts and heat waves periods will increase for most parts of Europe, as well as short intense rain events. Preserving and improving productive agricultural land in this region is vital, especially through the application of sustainable soil and crop management practices that promote soil fertility and water conservation; this will improve resilience to degradation and to extreme climatic events.

ReCROP is a European project that aims to identify sustainable and resilient agricultural production systems in the Mediterranean region through the combined use of biotechnological tools, such as bioinoculants, and environmentally friendly agronomic practices. ReCROP will assess different agroecosystems with key local crops (i.e vineyards, maize and aromatic/medicinal plants) of the Mediterranean region under field conditions to help improve crop resilience, yield, water conservation and soil health under the current scenario of climate change.

Soil organisms play a key role in ecosystem processes, leading to essential soil functions and are used as bioindicators of soil quality. Their monitoring is crucial to assess the impact of beneficial agricultural practices on soil functioning. One of the goals of ReCROP will be to evaluate the beneficial impact of different agricultural practices on the structural and functional soil diversity at different levels of the soil food web. The macrofauna and mesofauna (i.e springtails and mites) as well as microbial biomass, activity and biodiversity of soil microbial communities (bacteria, archaea, fungi) will be monitored with a special effort to produce a multitaxa index of soil biological quality. This work will contribute to identify which practices are beneficial for the biodiversity of Mediterranean agricultural soils, thus providing resistance and resilience, in terms of soil functioning and against soil disturbances.