

CEREALMED: ENHANCING DIVERSITY IN MEDITERRANEAN CEREAL FARMING SYSTEMS

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The biodiversity-based agriculture is currently considered an innovation target to enhance cropping sustainability and food security in the frame of climate changes. The constant reduction of biodiversity, because of intensive agriculture, is affecting all components of the farming ecosystem (crop varieties, crop species, soil microbioma, etc) and is increasingly considered a constraint for the development of sustainable cropping systems. The main scope of the PRIMA-CerealMed project (2020-2023) is to fill some gaps for implementing a biodiversity-based wheat cropping system in the Mediterranean area. CerealMed includes 11 research partners active in 7 countries around the Mediterranean basin (Italy, Spain, Morocco, Egypt, Lebanon, Turkey and Greece), to bring together expertise and innovation in genetics, agronomy, microbiology and agro-socioeconomics by an integrated approach.

Cerealmed addresses the challenge biodiversity from many different points of view, ranging from crop genetic diversity to alternative end-use of crops, from multi-crop farming systems to soil microbioma diversity, to achieve relevant ecosystem targets. Firstly, phenotypic diversity of Mediterranean collections of wheat, chickpea and lentil genotypes (including varieties, cvs and landraces, domesticated relatives) is being evaluated for adaptation to environmental conditions and quality traits under conservative agriculture (CA) management and for disease resistance, in multi-environment trials across the Mediterranean region; notably, the reference germplasm resource Global Durum Panel (GDP), established by the Durum Wheat Breeding Expert Working Group of Wheat Initiative is being evaluated. Then, new wheat, lentil and chickpea-related genetic diversity is being developed by inter-generic and interspecific crosses, and alternative end-uses of kernels and straw based on specific quality traits are being identified. At agronomic level, spatial and temporal combinations of wheat and legumes (rotation under CA/consociation) is being tested together with the use of tailored soil microorganisms to restore soil fertility by enrichment of soil biodiversity. Lastly, a bioeconomic model for assessment of sustainability is being implemented to compare the different options of biodiversity-based wheat farming in respect to more traditional/local agricultural

systems in terms of environmental and technical-economic outcomes/consequences at regional level.

Overall CerealMed is creating genetic and agronomic knowledge, tools and approaches to develop a profitable and eco-sustainable strategy of biodiversity-based wheat farming for countries of the Mediterranean basin.