

Soil biodiversity enhancement in European agroecosystems to promote their stability and resilience by external inputs reduction and crop performance increase – SoildiverAgro

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INTRODUCTION

The agricultural sector is essential for European food security and it is present in many socio-economic EU's frameworks. In fact, the European Common Agricultural Policy (CAP) is one of the most important European policies in terms of budget (39% in 2015).

However, there are many challenges for Europe around agriculture that have not been adequately addressed yet. The most important is the livelihood of millions of farmers who face a high amount of threats related with agricultural profitability and stability. Loss of soil biodiversity represents one key challenge and may adversely affect the functioning, stability, resilience and adaptability of agro-ecosystems and associated ecosystem services, both within and beyond the farm level.

Therefore, the protection and enhancement of soil biodiversity should be an important objective for farmers. However, there is currently a lack of incentives (agronomic, economic and social) for farmers to safeguard biodiversity.

SoildiverAgro is a project financed by H2020 program focused on fostering synergies between crop production, biodiversity and the delivery of ecosystem services. The main objective of SoildiverAgro is the adoption of new management practices and cropping systems that enhance soil genetic and functional biodiversity to reduce the use of external inputs while increasing crop production and quality, the delivery of ecosystem services and the EU agricultural stability and resilience.

SoildiverAgro outputs consider:

1. enhancement of soil biodiversity
2. reduction of pest/diseases incidence
3. increases in plant growth and development
4. increases in crop yields, quality and value
5. the reduction of inputs
6. increases in soil fertility
7. reductions of soil contamination
8. reduction in GHG emissions
9. increases in soil C sequestration

To ensure rapid adoption of measures fostering soil biodiversity, improved methods and tools including for monitoring will be developed.

OVERALL CONCEPT AND METHODOLOGY

The overall concept of SoildiverAgro is to enhance soil biodiversity across European croplands, the benefits of soil micro- and macro-organisms for agricultural production should be better understood, applied and transferred to farmers. Farmers will not adopt cropping systems and management practices that enhance soil biodiversity

The conceptual design of SoildiverAgro (see Figure) starts with the identification of farmers' threats and needs to tackle them, followed by the identification and development of management practices and cropping systems that can enhance soil micro- and macro-organisms genetic and functional diversity to promote beneficial

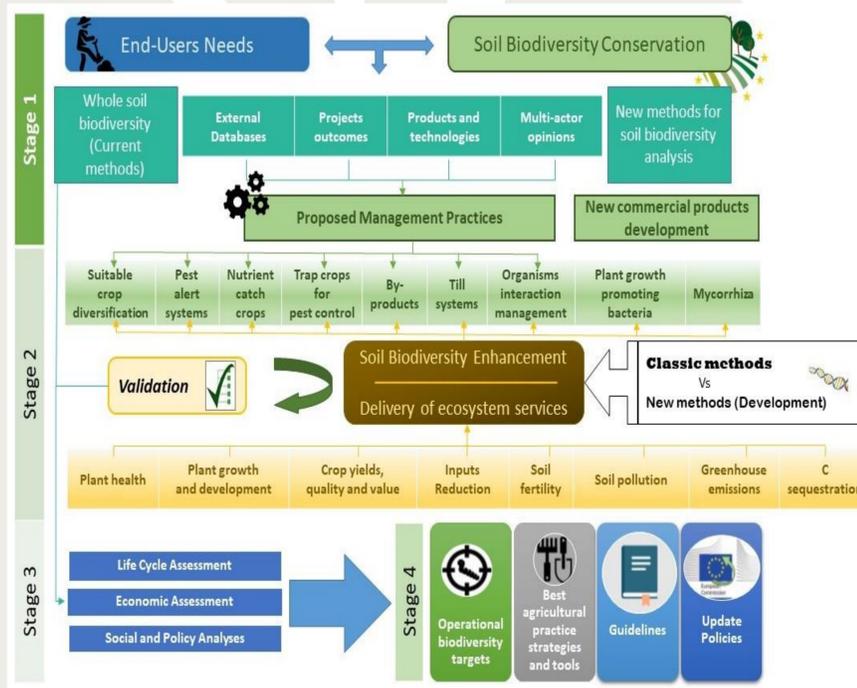


Fig.: Conceptual design of Soildiver Agro

unless the economic and environmental profitability of an adequate soil biodiversity management is demonstrated for agro-ecosystems, providing evidence that this approach can foster stability and resilience of European agroecosystems. Stakeholders and end-users knowledge will be used in SoildiverAgro to define the experimental design by identification of farming threats, problems, needs and crop management alternatives. The main hypothesis of the project is that an adequate soil biodiversity management implemented via different agronomic practices tailored for different pedoclimatic conditions under various cropping systems will contribute to enhance soil micro- and macro-organisms diversity, and thus, reducing current economic, social and environmental challenges.

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synergistic plant-organisms interaction. This leads to improvement in crop health, growth and development, crop productivity, quality and value, and delivery of other ecosystem services (inputs reduction, increases in soil fertility, pollution reductions, greenhouse gas emissions reductions and increases in C sequestration).