

REVINE

Regenerative agricultural approaches to improve ecosystem services in Mediterranean vineyards

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Abstract:

REVINE is a 3 year European projected funded by PRIMA programme which proposes the adoption of regenerative agriculture practices with an innovative and original perspective, in order to improve the resilience of vineyards to climate change in the Mediterranean area. The potential for innovation lies in developing and combining new approaches that make agriculture more environmentally sustainable and enable a circular economy capable of improving farmers' incomes. Primarily REVINE aims to improve soil health and biodiversity by promoting the multiplication of soil saprophytic microorganisms and the presence of useful microorganisms linked to the life cycle of the plant, such as rhizobacteria (PGPR) and fungi (PGPF) that promote plant growth which, in addition to increasing plant performance, increase tolerance to biotic and abiotic stresses.

The project has the main goals to improve the biodiversity in vineyard and the fertility and water availability of soil

Regenerative agriculture ameliorates soil structure and microbial biodiversity that, in turn, leads to crop resilience against biotic and abiotic stressful factors. Moreover, enrichment of beneficial microbes in the rhizosphere, such as PGPR and PGPF, are known to trigger the plant immunity inducing the priming state. REVINE intends to improve the biodiversity in the vineyards by using multiple approaches, including: i) screening of tolerant grapevine genotypes; ii) consociation of the grapevine with profitable cover crops; iii) the use of cultivation practices able to enhance soil biodiversity and the beneficial rhizosphere microorganisms.

REVINE, by means of Regenerative Agriculture, intends to rebuild soil organic matter and restore degraded soil biodiversity, resulting in both carbon drawdown and water cycle improvement, by using biofertilizers and amendments (fermented manure, compost and biochar). In particular, biochar is a carbon-rich substrate that has multiple effects and can be used as soil amendment. It increases soil water-holding capacity and nutrient-availability for plants, thus positively affecting plant growth and preventing water stress. Moreover, by improving soil's physical and chemical properties, biochar modifies microbial habitats and fosters the presence of plant beneficial microbes. Biofertilizers and amendments will be produced from crop residues. In this way, REVINE intends to valorize agricultural waste and to increase farmers income, promoting the circular economy.

Keywords: Regenerative agriculture, vineyards, soil microbial biodiversity, biofertilizers.