



## Background information of the Pilot area

The Menemen Plain, located in western Türkiye, is a fertile but increasingly vulnerable agricultural zone. Farmers mainly cultivate cotton, wheat, corn, and vegetables. However, the plain's flat landscape, high groundwater table, and proximity to the sea result in poor natural drainage. These conditions have led to severe soil salinity over time, especially in areas where surface irrigation has been applied without proper drainage infrastructure. The combination of salinity and low organic matter has significantly reduced crop yields and soil health. The restoration practice aims to reverse these effects by improving drainage and enhancing soil quality, ensuring long-term agricultural sustainability.

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Links to further resources on the restoration action

• UTAEM Official Website

<https://www.utaem.gov.tr>

Provides information about training programs, ongoing research, and agricultural innovation support in Türkiye.

• Tarım ve Orman Bakanlığı – Tarımsal Desteklemeler  
<https://www.tarimorman.gov.tr/Konular/Tarimsal-Desteklemeler>

Offers information on available agricultural subsidies and soil improvement supports in Türkiye.

## REACT4MED

Land degradation such as soil erosion and desertification, along with climate change, are serious threats to agriculture in the Mediterranean. In order to restore degraded soils, we need solutions that pay off and which are good for the people and the environment.

The REACT4MED project aims to improve agricultural productivity, promote innovation, restore soils, and thus improve livelihoods in Mediterranean communities.

In eight pilot areas situated in Turkey, Morocco, Israel, Egypt, Cyprus, Greece, Spain, and Italy, large-scale land restoration actions are initiated and monitored. These actions include combating soil erosion through conservation agriculture, terracing, cover crops, reforestation, mulching and improved irrigation practices.

Stay in touch through our website:

[www.react4med.eu](http://www.react4med.eu)

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Project duration:

May1 2022 to October 31 2025

## Enhancing soil health: Effective drainage and improvement practices in Lower Gediz



# PRIMA

PARTNERSHIP FOR RESEARCH AND INNOVATION  
IN THE MEDITERRANEAN AREA



### Implementation story from the pilot area

Mehmet is a dedicated farmer from Menemen, Izmir. On 30 hectares of arable land, he cultivates wheat, cotton, corn, peas, melons, and tomatoes. For three generations, his family has depended on farming, facing challenges due to an arid climate and salinity of soils due to their coastal location. Since the 1980s, Mehmet has worked to restore unproductive land for agriculture. Mehmet's family farm is a small to medium-sized business, but he distinguishes himself through his openness to new ideas and enthusiasm for research. His involvement in community projects has provided him with practical knowledge, making him a leader and example for fellow farmers in the region. Always seeking innovation, he collaborates with UTAEM in the React4Med project and serves as a role model for fellow farmers.

### The role of the research institute in the Pilot Area

At UTAEM, we believe that the most effective solutions grow from the field itself. That's why we work side-by-side with local farmers like Mehmet to restore degraded soils and ensure the long-term productivity of agricultural land. Through the React4Med project, we combine traditional knowledge with scientific innovation to build resilient farming systems adapted to changing climatic and environmental conditions

### Implementation requirements

To implement this restoration action elsewhere, the first step is to assess the severity of soil salinity and identify areas with inadequate drainage. Flat landscapes with a high water table or proximity to the sea are particularly at risk. Installing a subsurface drainage system is essential to remove excess salts and lower the groundwater level. After drainage is established, washing the soil with high-quality water is necessary to leach accumulated salts.

Next, incorporate well-composted farmyard manure to rebuild organic matter and improve soil structure. This supports microbial activity and enhances nutrient availability. In the following years, the introduction of a drip irrigation system is recommended to deliver water precisely to the root zone, preventing further salt accumulation and reducing water use.

Ongoing maintenance includes regular inspection of drainage functionality, avoidance of over-irrigation, and annual application of organic matter to sustain improvements. Success depends on careful monitoring, farmer engagement, and adaptation to local conditions such as soil texture, water availability, and crop selection.



### Benefits

This restoration action provides multiple short- and long-term benefits for both farmers and the environment. In the short term, the installation of proper drainage systems and application of soil improvers such as well-composted manure immediately enhance soil aeration, reduce salinity, and increase crop productivity. Improved irrigation efficiency through drip systems also lowers water use and input costs.

In the long term, the build-up of soil organic matter leads to better soil structure, higher water retention, and increased resilience to drought. Reduced dependence on chemical fertilizers supports healthier soils and limits environmental pollution. For land users, these improvements mean more stable yields and a more sustainable farming system.

Ecologically, restoring soil health supports biodiversity, particularly beneficial soil organisms and pollinators. Cleaner water drainage improves water quality in nearby ecosystems. The combined improvements promote sustainable land use, preserve landscape aesthetics, and open the door to future opportunities like agritourism. This restoration approach contributes to climate resilience and long-term food security in Mediterranean farming systems.