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Irrigation is basic to improve agricultural productivity in the Mediterranean regions, characterized by hot dry summers. However, irrigation also increases evapotranspiration and salts accumulation in the soil profile, decreasing crop yields and, ultimately, leading to land desertification and abandonment.

Salinization and nutrient leaching control, associated to water economy, are sufficient reasons for establishing sound management options to improve crop yields and minimize soil degradation. These basic objectives for sustainable soil management are being applied to agricultural fields located in Roxo's irrigation district (Aljustrel), adapting the irrigation to the soil properties through hydrological modeling (10 parcels with representative soils) and crop development (olive tree and pomegranate).

This project aims: 1. to identify and monitor soil salinization susceptible areas in the irrigation district; 2. to study the effect of irrigation water quality on crop development using physiological indicators and, relating them with yield; 3. to improve irrigation water management and nitrogen fertilization using modeling tools which will help minimizing soil salinization risks; 4. to develop a WebGIS platform for soil degradation awareness and promotion of best agricultural practices.

The working program necessary to achieve these objectives will include the monitoring of irrigation water quality of the Roxo reservoir, and the study of the spatial distribution of soil properties using electromagnetic induction and geostatistical methods. The WebGIS platform will integrate several modeling results (soil water content, soil salinity, nitrate leaching and crop growth) allowing to choose sustainable soil management solutions for different tailor made scenarios.

This project will also contribute to improve the Portuguese tools available for the implementation of the Nitrate Directives and the Water Directive, and for soil conservation. To achieve its several objectives this project has a multidisciplinary team from four institutions.

Palavras chave: soil salinity, solute transport, nitrate leaching, modelling, HYDRUS, MOHID-Land

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