

## “RE-UTILIZATION OF DRAINAGE SOLUTION FROM SOILLESS CULTURE IN PROTECTED AGRICULTURE. FROM OPEN TO CLOSE SYSTEM”

### LIFE DRAINUSE NETWORKING

#### COORDINATING BENEFICIARY

Centro de Edafología y Biología Aplicada del Segura (CEBAS-CSIC)

#### PARTNERS

- Agencia Estatal Consejo Superior de Investigaciones Científicas. Centro de Edafología y Biología Aplicada del Segura (CEBAS-CSIC)
- Riegos y Tecnología, S.L (RITEC)
- Federación de Cooperativas Agrarias de Murcia (FECOAM)
- Departamento de Ingeniería de la Información y las Comunicaciones. Facultad de Informática. Universidad de Murcia (UMU)

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#### DESCRIPTION

Open hydroponic systems are widely present in the European modern agriculture. However, in open hydroponic systems drainages are released into the environment. The drainages are composed by 31% of nitrates, and 48% of potassium applied as fertilizers, with the concomitant pollution and eutrophication of land and water. As an alternative to open hydroponic systems, a full re-circulation system, also known as closed system, have been developed in The Netherlands, but the percentage of producers that use it in their greenhouses in the rest of Europe is very low mainly because these systems need to be specifically designed and adjusted to the specific conditions where production is taken place. For that reason, the aim of the LIFE DRAINUSE is to demonstrate the feasibility of using a full re-circulation system for soilless culture in the Euro-Mediterranean region, where more than the 60% of Greenhouse production takes place. This aim will be achieved through a modular and scalable pilot system, easily adaptable to most of the agricultural scenarios in south Europe by just modifying the capacity of their components. The demonstration of a pilot system at a 1:10 scale becomes necessary for identifying potential problems, costs, energy consumption, optimization of key steps and software depuration. The system will be dimensioned as a function of the volume of drainages per day that needs to be recirculated.

## OBJECTIVES

The aim of the project will be achieved through the next specific objectives:

- To demonstrate through the design, construction and set up of a full re-circulation pilot system the technological possibility for Euro-Mediterranean regions of drainage reuse. The pilot system will be assayed in tomato plants, one of the most economically important and extended crop in south Europe. The pilot system proposed here will be able to collect the drainages coming from the normal irrigation of the tomato plantation, to disinfect them and to adjust the nutrient concentration, pH and electrical conductivity with the purpose of making drainages re-usable for a new irrigation cycle.
- To propose a legal and regulatory framework for drainage recirculation to Euro-Mediterranean regulatory bodies
- To disseminate to all interested stakeholders, the benefits of full recirculation systems as an environmental friendly solution for drainage release of hydroponic greenhouses.

## INDUSTRIES

Producers of horticultural products