The highly efficient irrigation systems of the Solar Greenhouses of Southern Europe guarantee optimal use of water.

Aware that water is a valuable and scarce resource, the greenhouse crops optimise water resources to the maximum through precision agriculture that ensures water is used rationally and efficiently.

The use of rainwater, channelled from the plastic roof covers, can cover up to 35% of the crop's needs.

The Solar Greenhouses in Almeria and Granada are located in a semi-desert region where water is a rare commodity due to the scarcity and irregularity of rainfall. Farmers understand better than anyone how valuable every drop of this precious element is. At the beginning of agricultural development, crops were mainly irrigated with groundwater, but this is insufficient to meet current needs. Since its inception, farmers have invested heavily in new technologies to reduce and optimise water consumption. As a result of these efforts, the Solar Greenhouses in Almeria and Granada producers can boast one of the most efficient irrigation water management models for arid areas in the world.

Efficient water use

Water scarcity is a recurrent global problem in agriculture in most areas with a Mediterranean climate, such as the southern coast of Spain. Producers in Almeria and Granada have the efficient and sustainable use of this precious resource as one of their top priorities. The use of reservoirs, seawater desalination plants, and rainwater harvesting on the roofs of greenhouses are essential technics to guarantee water supply to crops all year round and preserve the groundwater table's sustainability.
The collection (or harvesting) of rainwater, compulsory in all solar greenhouses, is carried out through channels on the roofs of these structures connected to a system of pipes for conduction to irrigation

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ponds. In this regard, studies by IFAPA[1] (Andalusian Institute for Agricultural, Fisheries, Food and Organic Production Research and Training) have shown that rainwater harvesting can cover more than 35% of crop needs throughout the agricultural campaign.

However, farmers in Almeria and Granada feel that these efforts to find new water sources are still not enough. To produce the best fruit and vegetables in their solar greenhouses, they are constantly looking for ways to optimise their consumption. To this end, they are continually investing in state-of-the-art technology, transforming and making their irrigation water application model more and more efficient.

One of the first initiatives implemented in this area to optimise consumption was the use of sanding. This technique consists of applying a layer of sand of about 8 cm on top of the cultivated soil. Sanding avoids water loss through evaporation and prevents soil salinisation.

Another fundamental milestone is to get the most out of the precious liquid element. This system is very efficient and allows localised water and fertiliser application at the foot of each plant, where its roots are located. Nowadays, with the introduction of climate sensors (temperature, relative humidity, sunshine, etc.) and irrigation sensors (evapotranspiration, electrical conductivity, pH, the water content in the soil, etc.), the Solar Greenhouses in southern Spain integrate climate control with irrigation and fertilisation, achieving genuinely excellent levels of efficiency in the use of water together with large,

[1] IFAPA, (2016): "El sistema de producción hortícola protegido de la provincia de Almería"
https://www.juntadeandalucia.es/export/drupaljda/noticias/16/07/160708_El%20Sistema%20de%20Producci%C3%B3n%20Hort%C3%ADcola%20de%20la%20Provincia%20de%20Almer%C3%ADa.pdf

high-quality productions.
According to Rafael Joaquin Baeza Cano, a specialised technician from the IFAPA Centre in La Mojonera, "the use of irrigation technologies on demand employing electro-tensiometers coupled to irrigation programmers has allowed us to maximise irrigation efficiency up to 100% (0% drainage during the growing season), obtaining yields from 20 kg per m3 of irrigation water used in pepper crops and up to 40 kg per m3 in courgette crops".

Low water footprint

As a result of these efforts, in the Solar Greenhouses of Southern Europe (mainly located on the coast of Almeria and Granada), where half of the fruit and vegetable products consumed on the continent are produced, the water footprint is up to 20 times lower than the average for national agriculture as a whole. The water footprint measures the volume of water needed to obtain the products or services consumed by a person.

What is a solar greenhouse?

A solar greenhouse is a closed structure covered with a plastic film through which the sun's rays shine, giving the plants the light they need to maintain the right temperature for their development during the winter months so that they can carry out photosynthesis. In the process, the plants produce nutrients from the CO2 they absorb from the air and release enormous amounts of oxygen into the atmosphere. Solar greenhouses are very different from the production methods used in other greenhouses, which use fossil fuel-based heating and lighting systems that consume up to 30% more energy and are therefore harmful to the environment.

About CuteSolar

CuteSolar is a promotion programme funded by the European Union (EU) and supported by a consortium of Andalusian fruit and vegetable

growers' associations (APROA), the Spanish inter-branch fruit and vegetable association (HORTIESPAÑA) and the Assembly of European Fruit and Vegetable Growing Regions (AREFLH). The aim of the information and promotion campaign, which will run until 2022, is to inform consumers about the sustainable and environmentally friendly production and cultivation methods of EU fruit and vegetables, the high standards of greenhouse technology and the quality of fruit and vegetables from southern Spain.
The programme, with a total investment of €1.95 million, is co-financed by the proposing organisations and the European Union, will run for three years (2020-2022) and will be implemented in Spain, Germany and Belgium.

Disclaimer

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