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## “CASCADE HYDROPONICS”

**An integrated approach to increase productivity, resource use efficiency and sustainability of protected horticulture CasH**

*Deliverable 6\_ [3.2.1]: Iterative optimization of cultivation techniques for the secondary crops*

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D6 [3.2.1]: [Iterative\_optimization\_of\_cultivation\_techniques\_secondary\_crops]

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## 1. Summary

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The volume of the nutrient solution provided to a soilless crop, is usually 25-40% higher than the actual plant needs. In open systems, the drained nutrient solution is discharged to the environment. In closed systems, the nutrient solution that is drained is collected and returns to the hydroponic head, where conductivity, nutrient concentration and pH are measured, and if conductivity is within the tolerance range of the crop, is corrected for its nutrient concentration and pH and reused to fertirrigate the crop. Reuse of the resulted drainage solution, however, is associated with the risk of pathogen propagation throughout the fertigation system and strongly aggravates the salt accumulation in the root zone.

In order to overcome these problems, the "Cascade Hydroponics" project proposes the development and evaluation of a novel approach in integrated production for intensive greenhouse horticulture, the "cascade" fertigation concept.

The concept involves the process of irrigating crops in a series of increasing crop salt tolerance, where the drainage water collected from the first (primary) crop, is used to irrigate a second (secondary crop) more salt tolerant crop; and then, the drainage from the secondary crop is used to fertigate a third (tertiary) crop that is even more tolerant than the first two.

The incorporation of the current technological innovation to the grower's practice will result, overall, in the improvement of the efficiency of this production system, achieving high profit yields in an environmentally sustainable framework.

The aim of the current CasH deliverable [D6\_(3.2.1)] with title "Iterative optimization of cultivation techniques for the secondary crops" is to present the prototype equipment developed in the experimental greenhouse of the University of Thessaly in Greece in order to build an innovative cascade system-layout in which the nutrient solution drained from the main cultivation, is used for a secondary crop.

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The deliverable is available upon request

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