

Irrigation management and mycorrhization in horticultural crops

Summary

In this project, taking tomato cultivation as a model, mycorrhization will be applied in planters and in plantations and will be combined with a minimised irrigation system that saves water and is compatible with high-quality production. This water saving can be achieved by adjusting irrigation through the application of soil humidity sensor technology, registering the results and undertaking remote management based on the data generated. This project will implement a practical application to show the water-saving capability of this technology, which is currently available and increasingly affordable for producers. Additionally, the microbiota of the soil is enriched with the application of mycorrhizal fungi, which may favour the abundance and the establishment of natural enemies of pests that affect crops.

The encapsulation of seeds with beneficial organisms, growth stimulators, biological control agents or microbial antagonists, is profiled as an innovative, effective and practical system within a water-saving scenario. The use of tomato seeds encapsulated with a mycorrhizal fungus will introduce this technology as an additional treatment in order to establish an effective symbiosis in tomato plants, and will enable the assessment of the advantages of this application, comparing it with traditional inoculum application in fields subject to a deficit of irrigation water.

Objectives

The main objective of the proposal is the rationalisation of the use of water in horticultural crops, and two specific objectives are framed within this goal:

1. Combine innovative irrigation reduction strategies with the application of mycorrhizal fungi that can favour the application of beneficial organisms.
2. Adjust the watering systems to ensure that productivity and quality remain high.

Description of initiatives outlined in the project

1. Rationalise the use of irrigation water in horticultural crops.
2. Implement inoculation systems with mycorrhizal fungi in plants in the planter and field phases.
3. Use mycorrhizae to improve the resistance of plants to minimised irrigation systems.
4. Monitor the establishment of natural enemies in mycorrhized plants submitted to deficient irrigation.

Expected results and practical recommendations

1. Reduce inputs (water, fertilisers, phytosanitary products).
2. Foster the presence of beneficial organisms.
3. Achieve sustainable, high-quality horticultural production.

The use of sensors to manage irrigation and the generation of biological products that facilitate the action of beneficial organisms in agriculture are the technological services this project aims to implement at horticultural farms. The most important contribution is the combination of these resources in a practical experience that demonstrates the benefits in order to offer solutions to a major problem for

Mediterranean horticulture: water scarcity.

Task force leader

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Subject area(s) of application

Agricultural production system
Biodiversity and nature management
Climate and climate change
Fertilisation and nutrients management
Pest/disease control
Plant production and horticulture
Soil management/functionality
Water management

Geographical area(s) of application

Province(s)

Tarragona
Barcelona

Region(s)

Baix Camp
Baix Llobregat
Maresme

Dissemination of the project *(publications, conferences, multimedia...)*

Technical Seminars

1. 5th Interactive Plant Life Protection Seminar (IRTA). Annual Technology Transfer Plan (PATT). Cabriels, 26 September 2018. Presentation of the pilot project on an informative poster. GO Irrigation management and mycorrhization in horticultural crops 2018–2020 Carme Biel, Amèlia Camprubi, Cristina Castañé, Nuria Agustí, Cinta Calvet, IRTA.

2. 22nd Jornada de l'Horta (Horticulture Seminar). Annual Technology Transfer Plan (PATT), Santa Susanna, 27 November 2018. Presentation of the Task Force Publications.

FitoNews 18 p. 26: 2018. Collaborating in irrigation optimisation. Semillas Fitó forms part of a subsidised task force to work on a project called 'Irrigation management and mycorrhization in agricultural crops'.

Project website

http://www.semillasfito.com/es/noticias-y-eventos/colaboramos-proyecto-optimizacion-riego_150.htm?pag=

More information on the project

Project dates

Starting date (month-year): June 2018

Completion date (month-year):

Current status: *Underway*

Budget approved

Total budget: €206,700.00

DARP funding: €84,474.00

EU funding: €63,726.00

Own funding: €58,500.00

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**Departament d'Agricultura,
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Order ARP/133/2017, of 21 June, approving the regulatory bases of grants for cooperation for innovation through the promotion of the creation of European Association for Innovation task forces in terms of agricultural productivity and sustainability and the execution of innovative pilot projects by these groups.

Resolution ARP/1868/2017, of 20 July, calling for applications for grants for the year 2017.

Project ID: 038_2017