



# CORE ORGANIC 2

## BIO-INCROP

### INNOVATIVE CROPPING TECHNIQUES TO INCREASE SOIL HEALTH IN ORGANIC FRUIT TREE CROPS

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# BIO-INCROP

## General traits of the project

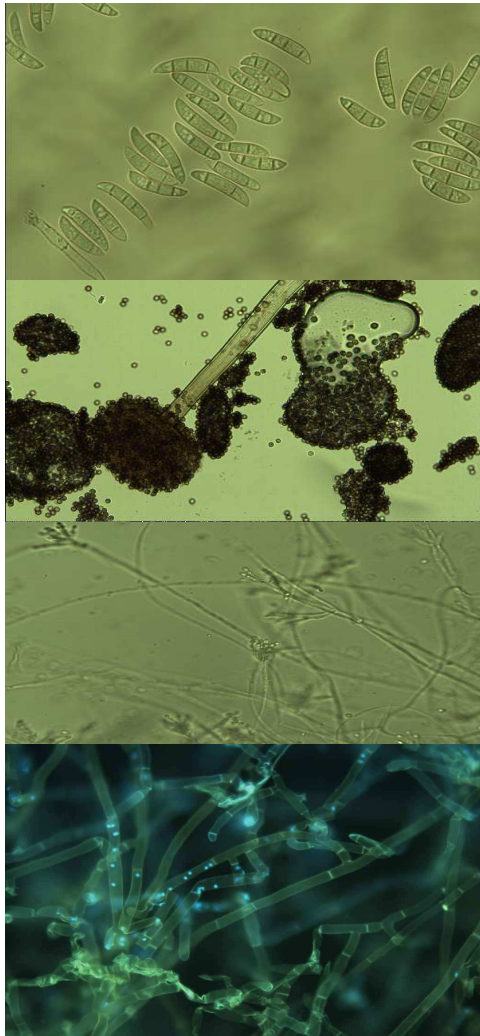
**Aim:** To increase knowledge about agro-management practices based on the study of microbial factors involved in soil suppressiveness and biological soil fertility.

**Research Actions** based on the exploitation of two categories of natural resources:

1. Biological resources **indigenous** to the orchard soil system
2. Natural resources **exogenous** to orchards

# 1. Resources **indigenous** to the orchard soil system such as:

Soil inhabiting microbial communities



Wild plant species able to colonize orchard ground cover



CORE ORGANIC

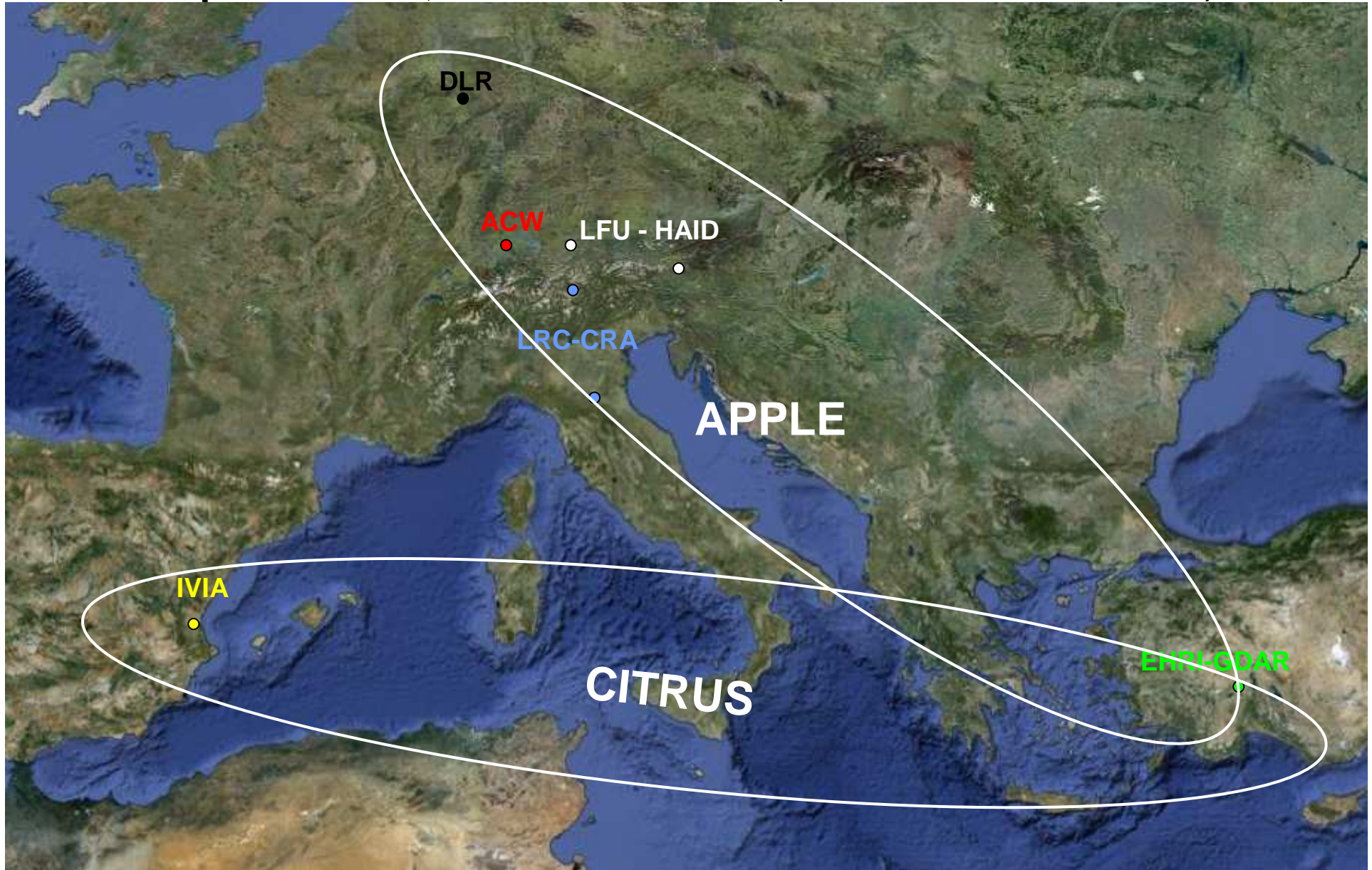
## 2. Natural resources **exogenous** to orchards such as:

- Waste-deriving material
- bio-formulates available in the market or under testing
- cover crops chosen among cultivated crops (cereals in particular)



# BIO-INCROR project

8 partners, 6 countries (A, CH, GE, IT, E, TR)



# Project Organization

- The BIO-INCROP project is a multidisciplinary project.
- Activities are planned with the close cooperation of:
  - **Agricultural research centers** working on organic farming, crop science and crop protection located in the main apple and citrus growing areas;
  - **Research groups** with specific laboratories and expertise in Soil biology & biochemistry, Microbial ecology and Plant pathology (Spain, Austria, Italy, Switzerland)

# Project hypothesis:

- The enhancement of **microbial biomass** and **diversity** in agricultural soils increases biological fertility and soil health.
- Continuous crops such as fruit tree crops are affected by replant disease. Replant disease is caused by a series of biotic components (root fungal pathogens and nematodes).
- Replant disease, like yield decline of the crops, is an **indicator of an unbalanced state** of soil microbial populations
- The enhancement of soil microbial biomass based solely on the increase of SOM content, requires long-term programs of organic amendment, whilst soil microbial diversity can be affected by cropping practices in the medium-term.
- The qualitative and quantitative response of soil microbial communities toward agro-management practices may be the clue for solving replant disease problems.

# Project objectives

1. To provide diagnostic tools for evaluating the actual occurrence of the biotic components of replant disorders.
2. To promote the use of indigenous or external resources for developing innovative management options aimed at:
  - Selectively increasing the components of soil suppressiveness;
  - preserving and increasing soil microbial biomass and diversity, by leading community composition toward a higher abundance of beneficial species.
3. To integrate the national guidelines for certified organic production with agro-management strategies based on eco-functional intensification of organic cropping systems.
4. To provide knowledge for supporting
  - critical adoption by farmers and local extension services of available organic amendments and bio-products (bio-pesticides, plant growth promoters or plant strengtheners, etc)
  - the development of soil management practices aimed at increasing soil suppressiveness according to the available natural resources and environmental conditions



# Work Packages

- **WP1** ELUCIDATION OF MICROBIAL COMPONENTS INVOLVED IN REPLANT DISEASES OF ORGANIC FRUIT TREE ORCHARDS IN EUROPE
- **WP 2** SEARCHING FOR INNOVATIVE AGRONOMIC OPTIONS
  - **Task 1** *waste deriving material* able to increase biomass and diversity
  - **Task 2** *cover crops* selection based on plant/microorganism interaction
- **WP3** SURVEY ON THE AVAILABLE LOW INPUT TOOLS FOR CONTROLLING REPLANT DISEASE
  - **Task 1** Evaluation of **biological active formulates** and strains of beneficial organisms (selected from those available on the market, products under testing etc)
  - **Task 2** Investigation of new low input **agronomical options** for the pre-plant phase of new apple orchards (tillage, soil movement, replant on strip line)
- **WP 4** INNOVATIVE MANAGEMENT OPTIONS FOR INCREASING FUNCTIONAL SOIL BIOLOGY IN ORGANIC FRUIT TREE CROPS IN MEDITERRANEAN AND TEMPERATE GROWING AREAS

# Users

- **Organic Farmers** and local agricultural **extension services**
- regional and national **committees** in setting protocols and **guidelines in organic farming**, with the introduction of means and options for improving soil biological fertility and soil health
- BIO-INCRP objectives represent added value to the organic food production for European **consumers**, who are receptive to strategies aimed at increasing biodiversity and preserving environmental safety.

# Dissemination

- Dissemination is expected among technical and scientific audiences given the interest in the main topics of the project; a number of initiatives will be made to promote understanding of the close correlation between soil microbial diversity and fruit quality.



**Thank you for your  
attention**

**BIO-INCROP**

