



# MASTER & MASTER OF SCIENCE PROGRAMMES IN “INNOVATIVE APPROACHES FOR IPM OF MEDITERRANEAN FRUIT CROPS” ACADEMIC YEAR 2020-2021

## DESCRIPTION

The Master of Science Programme provides a two-year curriculum whose main objective is to prepare a new generation of motivated students towards professional and academic careers that will promote integrated pest and disease management strategies for a sustainable intensification of arboriculture in Mediterranean agroecosystems.

The master frames the management of pests and diseases in arboriculture within an agroecological and food system perspective. Students will learn about ecology and epidemiology features of pests and pathogens, and innovative and smart tools for diagnosis, monitoring and management. IPM strategies will be presented and deeply analysed for major pests for Mediterranean fruit crops. In addition, students will learn about risks connected to emergent transboundary pests and diseases, and about quarantine measures for preventing and controlling diffusion.

At the end of the course students will know:

- ✓ how to analyse and plan agroecosystems for a sustainable management of pests and diseases;
- ✓ the range of products for pests and diseases control and regulations;
- ✓ the tools for a rapid and timely diagnosis and monitoring of crops pathogens and pests;
- ✓ how to solve farm problems by using diverse methods including farm biodiversity management, cultivars/graft combination choices, use of pesticides and biological control;
- ✓ how to plan and implement IPM programs for the main fruit crops, in different contexts;
- ✓ how to organize and manage important preventive measures for pest and disease control, i.e. plant quarantine, certification programs for plant propagating material.

The Programme is carried out in collaboration with national and international Institutions and Universities.

International scientists and practitioners, with a consolidated knowledge on the covered topics, will give lectures.

Students will also undertake several practical activities and assignments, aimed at developing their skills and competencies in the Master sector.

## ORGANIZATION

**First Year: 60 ECTS**

**Diploma: Master of MAIB / Master Universitario di I Livello (First level master)**

**Duration: 8 months (Dec 2020-Feb 2021 distance learning; Mar-Jul 2021 at CIHEAM Bari)**

**Second Year: 60 ECTS**

**Diploma: Master of Science**

**Duration: 12 months (mobility in the country of origin)**

## CANDIDATES' PROFILE

Courses are addressed to new graduate students and young professionals with a university background related to agronomic, horticultural and plant protection issues.

### Requirements:

- **Three years (180 ECTS) or four years (240 ECTS) of university studies;**
- **Four years out of five of university studies (240 ECTS)**, upon agreement between the sending University and CIHEAM Bari;
- **Five years of university studies (300 ECTS);**
- **Professionals** having a degree (3-4years) and at least **2 years** of experience in a field related to the Master Programme;
- Good Knowledge of **spoken and written English**;
- Personal access to **computer facilities**.

## ADMISSION

Selection of students is based on:

1. Screening of documents sent online by candidates to support their application;
2. Skype interview.

**Submission of applications through the online procedure**

**Deadline: 30 September, 2020**

## COSTS

**Registration fee: 200.00€/year.**

**Tuition fee: 500.00€/month** (travel, accommodation and insurance expenses not included)

## BENEFICIARIES

Master and MSc Programmes are open to candidates of any nationality

## SCHOLARSHIPS

CIHEAM Bari grants **full or partial scholarships** to candidates according to a ranking list. Priority is given to students coming from CIHEAM Member countries and other Mediterranean, Balkan and Middle Eastern Countries

**LANGUAGE OF INSTRUCTION: English**

For further information and application procedure:  
[www.iamb.ciheam.org](http://www.iamb.ciheam.org)

## FIRST-YEAR PROGRAMME MASTER/MASTER UNIVERSITARIO DI I LIVELLO DECEMBER 2020 – JULY 2021

The Master course will develop according to a series of teaching units and a final project:

Unit I - Sustainability in agriculture and food systems: it frames the concepts of sustainability applied to agriculture and food sectors and provides elements for understanding the main challenges to design solutions and actions towards sustainable agri-food systems. The multi-dimensions nature of sustainability challenges will be analysed, bringing students to reflect on processes for sustainability transitions in agri-food systems.

Unit II – Climate “smart” agroecology: Agroecology is the discipline that study ecological processes at the base of the functioning of agroecosystems. The course aims to provide a widely applicable knowledge base to increase the resilience and production of agroecosystems in a changing climate scenario. Students will learn how to analyse the complexities and challenges of agroecosystems, and ways for sustainable planning of actions to mitigate and adapt to climate change and other global drivers of change.

Unit III - Smart tools for the management of natural resources in agriculture: it provides students with basic knowledge on the use of smart tools important for driving decisions towards more sustainable ways of natural resource management in agriculture. Focuses will be on Remote Sensing, Geographic Information Systems, Global Position Systems as tools for the acquisition, management, processing, analysis and display of spatial data and information. Multi-model mechanistic approaches and examples of multi-criteria Decision Supporting Systems will be also presented.

Unit IV - Fruit crops disorders diagnosis and identification: the unit provides students with a background on the range of Mediterranean fruit crop pests and diseases, and associated biotic and abiotic disorders, presenting options for identification and diagnosis using conventional and advanced laboratory/field techniques.

Unit V - Pest & disease control strategies: students acquire knowledge on basic principles of modern plant breeding and biotech resistance, as a proactive approach in the IPM strategy. They will also learn about the use of beneficial arthropods, the safe and sustainable use of agrochemicals and bio-rationales pesticides and the relative regulations for food quality and safety in IPM. A major focus will be on EU- Mediterranean legislations and regulations for phytosanitary measures.

Unit VI - IPM of Mediterranean fruit tree crops: the unit provides in deep knowledge on the main phytosanitary problems affecting Mediterranean fruit tree crops in pre-harvesting through pest/pathogen identification and detection and presents approaches and tools for a sustainable IPM strategy in compliance with EU regulations.

Unit VII - Transboundary pests & diseases: the unit presents emergent transboundary plant pests and diseases which are a constraint to food availability, food safety, and security, and ways for their management. Students will also learn about plant quarantine principles and systems, focusing in particular on the monitoring and control of some quarantine pests/diseases threatening the fruit tree crops in Mediterranean areas.

Project: through a work team, students will be engaged on a real project that, through literature review, field visits and contacts with stakeholders, will help them develop theoretical and practical skills on fruit tree crops IPM related issues.

## SECOND-YEAR PROGRAMME - MASTER OF SCIENCE

Students who have successfully completed the first year, and have met all the prerequisites set by the Institute, will be selected for the Master of Science level, and will carry out a scientific research on an original topic related to a plant or food health challenges for fruit crops.

Topics of MSc theses on pests of fruit and vegetable crops are to be chosen among the following research lines:

- Sampling methodology and technical protocols
- Pests monitoring, identification, detection, characterization and management
- Pest epidemiology
- Remote sensing, GIS and information technology applications to plant health
- Pest/disease forecasting models
- Detection and control of mycotoxins and contaminants in agricultural products.
- Assessment of damages and losses