Master of Science Programme in
Integrated Pest Management of Fruit Trees and Vegetable Crops (IPM)
Academic Year 2025-2026

DESCRIPTION

The Master of Science Programme in "Integrated Pest Management of Fruit Trees and Vegetable Crops (IPM)" provides a two-year curriculum whose main objective is to prepare a new generation of motivated students for professional and academic careers that will promote integrated strategies for sustainable pest management of fruit and vegetable crops in the Mediterranean agroecosystems.
The course introduces the management of phytosanitary problems from an agroecological and food system perspective. Students will study the ecology and epidemiology of pests, their integrated management and preventive control measures, and tools/products/interventions for diagnosis and monitoring. Academics and practitioners bring students through the analysis and understanding of Integrated Pest Management (IPM) strategies for key pests of Mediterranean crops and on related policies, institutions, and services. A significant focus is the management of emergent transboundary pests and on measures for predicting, preventing, and controlling their spread.

At the end of the course students learn:

- strategies to reduce the use of chemicals for crop protection, ensuring economic gain while protecting the environment and human health;
- agroecological factors that influence the epidemiology of major phytosanitary problems and the range of preventative measures for their control;
- how to make early diagnoses and monitor outbreaks of pests through territorial surveillance, field inspections, use of field devices, lab tools, and technologies;
- how to correctly plan treatments for pest control, and how to choose and manage products and control strategies;
- how to support, plan, and implement solutions for reducing losses after harvest of crops;
- how to organize and manage key services to avoid the introduction and spread of pests and diseases.

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

Lectures are held by international scientists and practitioners, with a consolidated knowledge on covered topics.

Students also carry out several practical activities and assignments, aimed at developing their skills and competencies in the Master's sector.

ORGANIZATION

First Year: 60 ECTS
Diploma: Master of CIHEAM Bari
Duration: October 2025 - June 2026

Second Year: 60 ECTS
Diploma: Master of Science of CIHEAM
Duration: November 2026 - October 2027

LANGUAGE OF INSTRUCTION: English

CANDIDATES' PROFILE

Courses are addressed to new graduate students and young professionals interested in Agricultural Sciences, Biology or Biotechnology (with a basic background in plant protection), integrated pest management of crops, and plant protection issues
Candidates must hold a university degree awarding at least 180 ECTS (three-year bachelor's degree), or they must have completed four out of five years of studies, upon agreement between the sending university and CIHEAM Bari (the year attended at CIHEAM Bari is recognized as final year to graduate at the University of origin). Work experience and other qualifications will be evaluated and considered an added value in the selection process. Candidates must possess strong proficiency in both spoken and written English and be familiar with the use of computer technologies.

ADMISSION

The selection of students is based on:
1. Screening of application-supporting documents
2. Online interviews

Applications: through the online procedure
https://www.iamb.it/education/application/

Deadline: 31 May 2025

COSTS

Registration fee: 200.00 €
Tuition fee: 4,000.00 €

SCHOLARSHIPS

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

For further details about IPM:
https://www.iamb.it/education/ipm/

Unit I - Comprehensive Guide to IPM: Regulations, Guidelines and Tools (distance learning): this unit introduces the basic principles and strategic means for an Integrated Pest Management (IPM), to prevent deplorable product losses and to ensure safe pest control strategies in terms of human and environmental health. This unit also shed light on futuristic remote sensing-based pests and diseases and surveillance using geographic information systems, global position systems and multi-model mechanistic approaches; all necessary for decision supporting systems in modern remote-controlled agriculture. This unit will introduce the regulations and directives to important topics referring to harmful regulated pests and emergent transboundary phytosanitary problems.

UNIT II - Conventional and Advanced Strategies for Pest and Disease Control: this unit provides knowledge on the application and development of eco-friendly control strategies to plant pests for banning the use of pesticides for sustainable and safe agriculture. Thus, this unit will introduce the use of innovative control methods and strategies, i.e., exploitation of genetics and host resistance, biological control, semi-chemical approaches, sustainable rational use of pesticides, and ademption to regulatory and international standards of control.

UNIT III - Viruses and Virus-like Diseases in Fruit Trees and Vegetable Crops: this unit introduces knowledge on the morphology, aetiology, epidemiology, and ecology of important plant pathogenic agents of diseases, i.e., viruses, viroids and phytoplasmas, infecting fruit tree and vegetable crops in nature. The unit also presents "modus operandi" for the timely detection of biotic agents through on-farm field inspections and laboratory diagnostic techniques. This unit will make students acquainted to the application of conventional and highly advanced technologies in diseases diagnoses, besides to the innovative biotechnological tools to cope with the virulent nature of some important virus and virus-like diseases at the farm and territorial level. In addition, this unit will provide guidelines on the certification program as an important tool to prevent the dissemination and introduction of new pests and diseases in the EU region.

UNIT IV - Bacterial and Fungal Diseases in Fruit Trees and Vegetable Crops: this unit introduces the most important bacterial and fungal diseases that affect the fruit tree and vegetable crops, together with their relevance, distribution, ecological features, epidemiological processes, and containment in the Mediterranean region. In addition, this unit will introduce different laboratory techniques, field forecasting and modelling strategies for the isolation, characterization, control, and management of these pathogens, respectively. Additional diseases elicited by the abiotic factors (physiological disorders, nutrient deficiency, etc.) will be introduced.

UNIT V - Identification, Control, and Prevention of Pests in Fruit Trees and Vegetable Crops: this unit provides basic knowledge and key elements for identifying and characterizing insects and nematodes that affect crops. Students will learn the safe and sustainable use of agrochemicals and biorational pesticides for controlling important pests of fruit tree and vegetable crops. Furthermore, this unit will introduce innovative approaches of forecasting models related to the spatial and temporal spread of insects for prompt interventions and control strategies in the field.

UNIT VI - Sustainable Post-harvest Control Strategies and Regulations: this unit will introduce various aspects related to post-harvest diseases, contaminants and nutritional losses normally occurring during the food chain processing, thus leading to significant hazards to the environment and human health. Knowledge of the key critical control points during the harvesting and storage stages of the production chain are essential in developing effective prevention strategies post-harvest. Thus, strategies of good agricultural practices, safe control and limitation of food contaminants, certification, and regulations to cope with post-harvest diseases will be introduced, for a safe and sound management of pests and post-harvest problems.

UNIT VII - Plant Quarantine and Surveillance: this unit provides students with guidelines and preventive action strategies against the entrance and diffusion of key pests and pathogens, in the frame of quarantine measures, contingency plans for priority pests, and eradication systems converging on the management of various plant pests and pathogens in the context of global climate change and spread of native and invasive pests; involving all key actors in the production chain, *i.e.*, farmers, research institutes, advisory services, and governmental bodies.

Individual Mini-Research Experimental Project (IMREP):
An IMREP is an applied experimental research proposal that is built on students' knowledge acquired during the year from lectures and assignments. The student will carry out field and laboratory basic research experiment related to fruit tree and\or vegetable phytosanitary problem; on which he should discuss the outcome in the presence of a commission at the end of the academic year.

Action Learning Project (ALP):
An ALP is a team-working project that prone students to primarily exchange among them the scientific information related to the project and secondarily their own knowledge, skills, experience and passing by the social and cultural background. The ALPs' activities will consist in technical visits, meetings and professional interviews with researchers, farmers, stakeholders, policy makers, etc.
Seminars and webinars: Students will follow several seminars and webinars that will be held by international experts on the latest research and discoveries in the world of agriculture, in relationship with the topics introduced in each unit.

Master of Science programme

Students must develop a scientific research on an original topic related to pest/food health challenge for fruit and vegetable crops at CIHEAM BARI and in their home countries, in collaboration with Italian and foreign Universities, under an academic supervision. Topics of the MSc theses are chosen considering CIHEAM Bari research priorities, the current funded research/cooperation programs, and bilateral agreements with public/private institutions and enterprises.
Topics of MSc theses on pests/food health of fruit and vegetable crops are to be chosen among the following research lines: Sampling methodology and technical protocols; pest monitoring, identification and detection; pest physico-chemical and molecular characterization; pest epidemiology; pest management and control; remote sensing, GIS and information technology applications to plant health; pest forecasting models; detection and control of mycotoxins and contaminants in agricultural products; alternative control means to be applied before and after harvest.

Research activity is supported by the following teaching units:

Unit 1: Research tools and methods: the unit aims to provide the students with theoretical and practical courses on relevant topics of research activity. Students will get practical skills through the designing of proposals and statistical analysis the obtained data

Unit 2: Scientific writing and proposals preparation: the unit aims to prepare the students to a scientific writing, effective communication and project preparation following the guidelines, template and tools for thesis writing