Integrated Pest Management (IPM)

of Mediterranean Fruit Tree Crops

organized by

Mediterranean Agronomic Institute of Bari

Integrated Pest Management of Mediterranean Fruit Tree Crops

MAI coordinator: Anna Maria D'Onghia

Aims

The Master of Science in IPM of Mediterranean Fruit Tree Crops has been designed to train graduate agronomists and biologists in modern and sustainable integrated management of economically important pests affecting citrus, date palm, grapevine, olive, pome and stone fruits in the Mediterranean basin. In order to prevent pests from reaching unacceptable infection threshold, or to reduce existing pest populations to acceptable levels, for a durable preservation of the environment and of natural resources.

Objectives

The main objectives of the course is to prepare IPM experts able to:

- apply and transfer the basic principles of IPM with emphasis on the bio-intensive strategy for an effective and sound management of undesirable pests present in the Mediterranean; through the application of low environmental impact active control options ;
- monitor and identify the crop key pests present in the Mediterranean area;
- monitor and control quarantine pests ;
- use and manage certified propagating material produced in the framework of the sanitary and clonal selection, as a compulsory proactive IPM strategy for the improvement of Mediterranean fruit crops.

Part 1
Post graduate specialization programme

The programme is organized in 9 units (60 ECTS), preceded by some introductory disciplines, and including a Diploming *Croplife* Training for IPM Trainers

Duration: 8 months from November to June

Unit I
02-21 Nov '09

INTRODUCTORY DISCIPLINES (7 ECTS)

***Content*:**
Scenarios of shared knowledge, techniques and technology of search. English language. IPM and Pesticides general concepts.

***Learning outcomes*:**
Harmonization of student technical background on general topics to support lectures understanding and bibliographic research.

Unit II
23 Nov '09 -13 Feb. '10

IDENTIFICATION AND CONTROL OF BIOTIC AND ABIOTIC DISORDERS (17 ECTS)
CROP LIFE DIPLOMING TRAINING

Content:
Introduction to the study of bacteria, fungi, nematodes, viruses, virus-like agents, insects, mites, weeds and physiological disorders.
Morphology, physiology, life cycle, multiplication, taxonomy, identification/diagnosis of pathogens and pests. Weeds classification and ecology.
Main conventional and non conventional control techniques. Plant tolerance and resistance to pests and diseases. Intervention threshold.

Learning outcomes :
Harmonization of student technical knowledge on general IPM concept, based on a modern and sustainable approach which implies a durable preservation of natural resources.
Training IPM trainers for the extension programme in the Mediterranean countries.

Unit III
15-23 Feb. '10

INTEGRATED PEST MANAGEMENT OF DATE PALM (3 ECTS)

Unit IV
24 Feb -10 Mar '10

INTEGRATED PEST MANAGEMENT OF OLIVE (4 ECTS)

Unit V
11 March - 3 Apr '10

INTEGRATED PEST MANAGEMENT CITRUS (6 ECTS)

Unit VI
6-24 April '10

INTEGRATED PEST MANAGEMENT OF POME & STONE FRUITS (6 ECTS)

Unit VII
26 Apr-25 May '10

INTEGRATED PEST MANAGEMENT OF GRAPEVINE (6 ECTS)

Content:
Morphological, ecological, epidemiological characteristics of key pests and disease agents. Detection, identification and IPM control.

Learning outcomes*:*
Deeping students knowledge on the main Mediterranean crop phytosanitary problems and provide them with useful tools (different type of practices) for a sustainable IPM approach

Study tour

Unit VIII 26 May-19 Jun '10	**APPLICATION OF IPM PROCEDURES, QUARANTINE & CERTIFICATION (7 ECTS)**
	***Content**:* Field IPM approach in accordance with the specific regulation. Quarantine principles and international regulations of plant pests. Main quarantine pests affecting fruit tree crops of Mediterranean importance and their control program. Principles and international regulations of sanitary selection and certification of propagating material.
	Learning outcomes: Provide students with regulatory basis and tools for a practical application in IPM production, quarantine and certification procedures.
Unit IX Jan – Jun '10	**INDIVIDUAL PROJECT (4 ECTS)**
	***Content*:** Bibliographic review, design and application of IPM strategy relatively to a specific crop.
	Learning outcomes: Enhance student ability to integrate course information and additional literature through the implementation of the IPM database and the preparation of a brief technical presentation for extension purposes.
21-26 Jun '10	**FINAL EXAMS**

EXAMINATIONS

Participants take a written examination at the end of each Unit. Examinations are in the form of written exams in classroom, including problems sets of questions, or exercises, or multiple choice test. Questions can also cover seminars topics.

Participants may retake failed exams once, and up to 8 ECTS credits.

To evaluate Unit IX, participants prepare a data base at the end of each unit and a poster on a specific topic to be evaluated by the IPM Scientific Staff.

At the end of the course, participants take a comprehensive oral examination before an international jury.

Language of instruction: ENGLISH. Simultaneous translation into French is provided.

ACADEMIC STAFF

In the Postgraduate specialization programme instruction is given by MAIB internal staff, and by 25 prestigious visiting professors from all over the world, coming from universities, higher institutions, international organizations and research centres.

In the Master of Science programme, student's research theses are supervised by MAIB researchers, or external professors in collaboration with MAIB staff.

Part 2
The Master of Science Thesis

Project (60 ECTS)

Supervised research work
Elaboration of an original thesis, related to a specific Mediterranean fruit crop species and pest, based on research work or technical study. The MSc thesis is carried out locally in the MAIB facilities, other scientific institutions or as mobility thesis in the local scientific facilities of the country.
The thesis activities are preceded by a short course on scientific writing, statistics, lab activities and field modules.
Besides the virus and virus-like agents and fungi of Mediterranean fruit crop species, in these last years the research has been addressed to other pathogens/pests of great interest for the Mediterranean fruit industry in order to meet the country needs.

General and specific competences acquired
Capacity to control entrance and spread of harmful quarantine and quality pests in the Mediterranean region;
Produce healthy native germplasm of Mediterranean Fruit Crops;
Update information on the sanitary status of fruit crops in the Med countries;
Create awareness on sanitary problems affecting fruit crops for preventing dissemination of harmful pathogens / pests across the Mediterranean area;
Set up, standardize, validate technical protocols for pest monitoring, detection and control before their application on a large scale;
Support harmonized legislative instruments for the application of phytosanitary rules.

Research activities: topics generally available for Master of Science theses

- **Viruses, viroid, phytoplasma and virus-like diseases** of Mediterranean fruit tree crops: characterization (biological, physico-chemical and molecular), epidemiology, diagnosis (biological, serological and molecular), distribution and incidence in Mediterranean countries, sanitation.
- **Fungal and bacterial diseases** of Mediterranean fruit tree crops: characterization, epidemiology, diagnosis (biological, serological and molecular). Biological control. Toxins of fungal origin.
- **Nematodes and insects;** Surveys, Characterization (biological, and molecular), Epidemiology**,** Role in virus transmission on Mediterranean fruit tree crops

INDICATIVE MASTER THESES REALIZED WITHIN THE AREA

1. Title: Management of the Red Palm Weevil, *Rhynchophorus ferrugineus*, in Italy as an introduction to it's control in Iraq (2008).
Author: Hasanein Yousif Abdul Raheem
Place of Implementation: IAM-Bari, Italy
Thesis director: Francesco Porcelli, Ibrahim Al Jboory, Anna Maria D'Onghia

2. Title: Interaction between wild plants, arthropods and their natural enemies in citrus orchards in Morocco (2007).
Author: Kaoutar Karori (Morcco)
Place of Implementation: DPVCTRF Morocco– IAM-Bari, Italy.
Thesis director: Jamila Wadjiny, Paolo Bàrberi, Jenny Calabrese, Smaili Moulay Chrif

3. Title: The olive knot disease in Morocco: Economic importance and distribution, characterisation of the bacterial strains and cultivars susceptibility. (2006)
Author: Taha Hosni (Morocco)
Place of Implementation: IAV Hassan II Agadir – IAM-Bari, Italy.
Thesis director: Mbarek Fatmi, Roberto Buonaurio

4. Title: Incidence of olive verticillium wilt and molecular characterisation of *Verticillium dahliae* isolates within the Maltese archipelago (2005)
Author: Timothy Pace Lupi (Malta)
Place of Implementation: University of Bari - IAM-Bari, Italy
Thesis director: Antonio Ippolito, Franco Nigro

5. Title: Sanitary status of stone fruits trees and typing of Plum pox virus isolates in Bosnia and Herzegovina (2004)
Author: Slavica Matic (Bosnia and Herzegovina)
Place of Implementation: IAM-Bari, Italy
Thesis director: Arben Myrta

Detailed additional information is available at http://www.iamb.it