

## TRACK THEME: SAFE PRODUCTION IN HORTICULTURE

- Montpellier SupAgro (France) for the M1
- University of Catania (Italy) for the M2

### M2 at University of Catania, Italy

#### Specific training objectives

Students attending the M2 at University of Catania should be able to:

- analyse the conditions of horticulture production in different agro-ecological environments;
- identify the interrelations between elements of horticultural cropping system and assess possible innovations and their expected consequences;
- critically evaluate processes and techniques for integrated protection of horticultural crops from pests and diseases, under the light of current research and theories for sustainable use and management of natural resources;
- design crop protection strategies in horticultural crops, that are compatible with environmental preservation and human safety.

#### Course structure

In this slot and during the first semester, students take the obligatory courses for a total of 24 ECTS and select, jointly with their tutors, one optional course for additional 6 ECTS. The second semester is entirely dedicated to the preparation of the master thesis (30 ECTS).

<b>First semester</b>		
<b>Obligatory courses</b>		<b>ECTS</b>
Fruit tree crops in Mediterranean climate		6
Vegetable and flower crops		6
Biological control of pests		6
Biological control of plant pathogens		6
<b>Total obligatory ECTS</b>		<b>24</b>
<b>Optional courses</b>		
Pest control in Mediterranean agrosystems	6 ECTS	
Applied plant virology	6 ECTS	
Vegetable protected crops	6 ECTS	
<b>Total optional ECTS</b>		<b>6</b>
<b>Total ECTS of the first semester</b>		<b>30</b>
<b>Second semester</b>		
Library, lab and field work aimed at preparing the master thesis		30
<b>Total ECTS of the second semester</b>		<b>30</b>
<b>TOTAL ECTS (1<sup>st</sup> + 2<sup>nd</sup> semester)</b>		<b>60</b>

## **DESCRIPTION OF THE OBLIGATORY COURSES**

### **Fruit tree crops in Mediterranean climate (6 ECTS)**

Students will learn detailed technical aspects in breeding and cultivation of the main fruit tree species in the Mediterranean area, such as especially citrus, olive and grape, in addition to fruit tree crops. Lessons and practices will take into account: origin and diffusion of the species involved; their morpho-physiological aspects; bio-agronomic characteristics and technological properties of the varieties; propagation and nursery; crop management.

### **Vegetable and flower crops (6 ECTS)**

The aim of the course is to deepen knowledge concerning the most important vegetable and ornamental crops in Italy. This know-how will be fundamental for an expert to be able to organise and manage production process in order to maximise yield, improve quality, reduce environmental impact. The course will be divided in lectures, lab activity and field excursion. These activities will concern the knowledge of the crops in terms of biology, crop requirements, and available cultivars. The main aspects of growing processes will be taken into consideration, with reference to crops that are representative of botanical groups, of plant and produce characteristics, and of specific growing processes.

### **Biological control of pests (6 ECTS)**

The student, already having a background on the main pests in agriculture and their control, will acquire through this course operative competencies for applying rational and advanced biological pest control methods in crops ecosystems, in order to reduce damage and economic losses. Main contents of the course are: biological and integrated pest control strategies; efficacy and eventual secondary effects of pest control on crops; pest management in the main crops ecosystems.

### **Biological control of plant pathogens (6 ECTS)**

This course has been developed to provide training in disease management in most important agro-systems. Main contents of this module are: estimating disease severity and incidence; chemical management with special reference to the strategies for use of chemical fungicides; development of resistance to modern fungicides and strategies for its avoidance; use of chemical pesticides in conjunction with biologics; biological management and strategies for biocontrol; approaches to cultural management with special emphasis to the soil solarization, organic amendments, tillage, crop rotation, planting date and planting spacing.

## **DESCRIPTION OF THE OPTIONAL COURSES**

### **Pest control in Mediterranean agrosystems (6 ECTS)**

This course aims to provide students with practical knowledge on insects and non-insect (mainly nematodes, mites and rodents) pests infesting cultivated plants, domestic animals and stored products, as well as on rational strategies for controlling their populations. In addition to a preliminary analysis of the main biological and structural features of each zoological group, attention is devoted to morphology, biology, damage and peculiar control methods of the species having a main economic impact on agricultural systems.

### **Applied plant virology (6 ECTS)**

The module is aimed to give to the students knowledge on phytopathological techniques to be applied in vegetable and fruit production, in order to diagnose and characterise virus agents of diseases and to acquire ability to apply an adequate crops control by integrated systems.

### **Vegetable protected crops (6 ECTS)**

The course is aimed at giving the students specific knowledge of growing methods and processes, with particular emphasis on crop organisation and management and technological support, for vegetables to be cultivated under greenhouse. The course, organised in lectures and field activity, will start from the main reasons justifying the adoption of certain processes; then the main aspects concerning soilless crops, seedling production and nursery activity, integrated and organic production, production timing and scheduling will be presented.