



Objective

Agricultural sectors are increasingly adopting Integrated Pest Management (IPM) to address the growing number of plant health challenges. As the shift towards sustainable agricultural practices becomes more urgent, professionals must acquire advanced skills to implement effective pest management strategies that balance productivity with environmental protection.

The course offers a comprehensive view of IPM principles, strategies, and practices. It will take a holistic approach to crop protection against weeds, diseases, and invertebrate pests across various agricultural sectors. The course will consider how to provide long-term, sustainable solutions to pest challenges by promoting the integration of cultural, biological, and chemical control methods. The critical role of IPM in mitigating the impacts of climate change on agriculture and ecosystems will also be explored.

The main objective of the course is to provide updated knowledge and practical skills necessary to implement IPM effectively, fostering sustainable pest management and environmental stewardship.

At the end of the course, participants will:

- gain knowledge about various types of pests, including phytophagous insects, plant pathogens, weeds, and their impact on agriculture and forestry;
- learn about modern challenges in IPM such as sustainable use of pesticides, prevention of emerging and invasive pests, and mitigation of climate change impacts;
- understand the holistic approach of IPM through: the landscape, good practices in the cropping system, non-chemical solutions, decision-making to avoid unnecessary treatments, a One Health approach to Plant Health, the consideration of the whole value chain in agriculture, and agroecology;
- acquire practical knowledge on improved tools for IPM, including methods for pest identification and diagnosis, application of smart farming (precision agriculture, robotics, artificial intelligence), plant resistance, biological control, behaviour modifiers, and biotechnological solutions;
- become familiar with initiatives for the adoption and scaling of IPM practices through participatory approaches such as the EU IPMWORKS hub and FAO's IPM Farm Field Schools;

- benefit from hands-on experience through case studies focusing on IPM systems in orchards, arable crops, protected vegetables, and vine crops;
- discuss the future of IPM, identifying current weaknesses and opportunities in research, policy, and stakeholder engagement.

Organisation

The course is organised by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (CIHEAM Zaragoza) with the collaboration of the Food and Agriculture Organisation of the United Nations (FAO).

The course will be held at the CIHEAM Zaragoza headquarters over a period of 1 week, from 17 to 22 March 2025, in morning and afternoon sessions. Online participation is also possible through live sessions transmitted from CIHEAM Zaragoza. The programme will be delivered in English by well qualified lecturers from international organizations, an agricultural association, from universities and research centres in different countries. Lectures are complemented by applied examples, case studies, a round table discussion and a field trip.

The course requires personal work and interaction among participants and with lecturers. The international characteristics of the course favour the exchange of experiences and points of view. Participants will be invited to present a case study about their experience on IPM in their country of origin.

Guest lecturers

Albajes, Ramón - UdL-Agrotecnio, Lleida (Spain)
 Alonso Prados, José Luis - INIA-CSIC, Madrid (Spain)
 Arnó, Judit - IRTA Cabrils (Spain)
 Crisol, Eduardo - COEXPHAL, Almería (Spain)
 De Kool, Stefanie - SMK, The Hague (The Netherlands)
 Furiosi, Margherita - Università Cattolica del Sacro Cuore, Piacenza (Italy)
 Gu, Baogen - FAO, Rome (Italy)
 Jiménez-Díaz, Rafael - IAS-CSIC, Córdoba (Spain)
 Kudsk, Per - AARHUS Univ., Slagelse (DENMARK)
 Lozano Tomás, Carlos - Servicio de Sanidad y Certificación Vegetal, Zaragoza (Spain)
 Melgarejo, Paloma - INIA-CSIC, Madrid (Spain)
 Montagnon, Jean-Michel - Chambre d'Agriculture, Départementale des Bouches-du-Rhône (France)
 Munier, Nicolas - UMR Agroécologie, Dijon (France)
 Pugliese, Massimo - Università degli Studi di Torino (Italy)
 Wyckhuys, Kris - University of Queensland, Brisbane (Australia)

Programme

0. Opening (1 hour)

1. Considerations about pests in agriculture (2 hours)

1.1. Types of pests

1.1.1. Phytophagous insects and mites

1.1.2. Plant pathogens: fungi, oomycetes, bacteria, viruses, viroids, mycoplasmas

1.1.3. Weeds

1.2. Types of damages caused by pests

1.3. Losses caused by pests in agriculture and forestry

1.4. Pest is not an intrinsic characteristics of the organism

1.4.1. Epidemiology and population dynamics: damage thresholds

1.4.2. Strategic basis for pest control

1.5. Factors determining occurrence of pests and damages

1.6. Causes of enhancement and control of pest populations

2. Major challenges of IPM systems for the modern age (3 hours)

2.1. Sustainable use of pesticide

2.1.1. Recent evolution of the amount of chemical pesticides and biopesticides used in agriculture and forestry

2.1.2. Impact on health and environment of pesticides

2.1.3. Pesticide resistance

2.1.4. Legislation in EU on pesticides

2.1.5. Minimize risk of pesticide use in IPM approach

2.2. Prevention of emerging and re-emerging pests

2.3. Reducing the spread of invasive organisms

2.3.1. Restrict trade of plants and plant material

2.3.2. Stricter regulations and also their application in border inspection

2.3.3. Quick and reliable detection and identification tools

2.4. Mitigation of causes and consequences of climate change

2.4.1. Reduction of emission of greenhouse gases

2.4.2. Prevision of the establishment and distribution of new invasive organisms

3. Holistic approach of IPM (4 hours)

3.1. Presentation of the concept

3.2. Landscape as the holistic vision for analysing and controlling pest populations

3.2.1. Functional scale of landscape

3.2.2. Key elements for and IPM approach

3.3. Cropping system. Good practices

3.4. Non chemical solutions

3.5. Decision making to avoid unnecessary treatment

3.6. Efficiency of treatment

3.7. Site specificity of IPM

3.8. Cost efficiency of IPM

3.9. A One Health approach to Plant Health and IPM

3.9.1. Concept of One Health

3.9.2. The need of uniqueness of the 'Health' concept

3.9.3. Why Plant Health must be included within the One Health concept?

3.10. Whole value chain

3.10.1. Security, safety and sustainability in the agrifood value chain

3.10.2. IPM and social, economic and environmental objectives of the agrifood system

3.10.3. An updated paradigm of IPM in the current agrifood system

3.11. IPM as component of agroecology. The vision of FAO

4. Improved tools for an efficient IPM (4 hours)

4.1. New methods for pest identification and diagnosis

4.2. Application of smart farming to IPM

Precision agriculture, robotics, artificial intelligence

4.3. Plant resistance to diseases and phytophagous arthropods

4.4. Biological control of pests

4.5. Behaviour modifiers

4.6. Biotechnological tools for IPM

4.7. IPM and Plant Health complexity

5. Adoption and scaling up IPM through farmer participatory approach (2 hours)

5.1. EU IPMworks hub

5.2. FAO IPM farm field school

6. Case studies (8 hours)

Short description of the most relevant agricultural practices; list of arthropod pests, diseases, weeds and their control; discussion of IPM systems available in the crop; and cost efficiency

6.1. Orchards

6.2. Arable crops

6.3. Protected Vegetables

6.4. Vine crops

7. Participants' presentations about their experience on IPM (3 hours)

8. Round table on IPM: current states and future of IPM (2 hours)

9. Closing session (1 hour)

10. Technical visit (6 hours)



Admission

The course is designed for professionals with a university degree, involved in crop production, pest management, and environmental conservation; researchers and scientists working in the field of agriculture, ecology, and environmental science; policy-makers and regulators working in agricultural and environmental policy development; extension workers and advisors providing support to farmers and agricultural communities; and students and educators interested in learning about sustainable pest management practices.

- 25 places will be available for face-to-face participation with access to lectures, case studies, round table discussion, and technical visit (36 hours).
- 30 places will be available for online participation with access to lectures, case studies, and round table discussion (30 hours).

Knowledge of English will be valued in the selection of candidates, as it will be the working language of the course.

Registration

- Candidates may apply online at the following address: <https://admission.iamz.ciheam.org/en/>
- Applications must include the curriculum vitae and copy of the supporting documents most related to the subject of the course.
- The deadline for the submission of applications is **15 December 2024**. The deadline may be extended for candidates not applying for a scholarship if there are free places available.
- Applications from those candidates requiring authorisation to attend the course may be accepted provisionally.
- Registration fees for the course amount to 500 euro for face-to-face participation and 350 euro for online participation. This sum covers tuition fees only.

Scholarships

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Türkiye), may apply during the registration process for scholarships covering registration fees, and for scholarships covering the cost of travel and full board accommodation in Zaragoza.

Candidates from other countries who require financial support should apply directly to other national or international institutions.

Insurance

It is compulsory for participants in face-to-face modality to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the Organisation, upon payment of the stipulated sum.

Contact:

Belkhodja, Ramzi

Academic coordinator

iamz@iamz.ciheam.org

<https://www.iamz.ciheam.org/education/advanced-courses/>

