

## 1-week ENDURE course in IPM

Southern European suggestion

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8.00-8.45	What is IPM?	Weed biology	Chemical control	Biological and microbial control of pests	Socioeconomic and environmental considerations of IPM
8.45-9.30	Indirect Plant Protection Methods	Monitoring and forecasting		IPM for a specific crop	Semiochemical-based control of pests
9.45-10.30	Arthropod pest biology	Decision support systems and spatial distribution of pests			
10.30-11.15	Pathogen biology				
11.30-12.15	Lunch	Lunch	Lunch	Lunch	Lunch
12.15-13.00	Arthropod pest identification	Weed identification	Application techniques	Identification of natural enemies and pathogen antagonists	Biological control in practice
13.00-13.45					
14.00-14.45	Pathogen identification	Decision support systems and spatial distribution of pests	Pest monitoring techniques	IPM-card game + intro to checklists	
14.45-15.30					

: Theoretical session  
  : Practical session/Group work  
  : Visits

## Suggested content of the course

### Monday:

Theme	Subjects to be covered
What is IPM?	<ul style="list-style-type: none"> <li>• Concept of IPM</li> <li>• Focus on the strategy to apply pest control methods</li> <li>• Focus the introduction on the 8 principles in the EU framework directive on sustainable use of pesticides</li> </ul>
Indirect Plant Protection Methods	<ul style="list-style-type: none"> <li>• Present the different indirect plant protection methods: legal methods (quarantine), agronomic techniques (including crop rotation and ecological infrastructures), and plant resistance</li> <li>• Present the use of crop rotations to minimize the problems (and pesticide use) in the field.</li> <li>• Emphasize the importance of plant resistant to pathogens</li> </ul>
Arthropod Pest biology	<ul style="list-style-type: none"> <li>• Characteristics of arthropod pests in agriculture</li> </ul>
Pathogen biology	<ul style="list-style-type: none"> <li>• Characteristics of plant pathogens in agriculture</li> </ul>
Arthropod Pest identification:	<ul style="list-style-type: none"> <li>• If possible use well prepared individuals, as this much better shows the differences, alternatively use pictures</li> </ul>
Pathogen identification:	<ul style="list-style-type: none"> <li>• If possible use plants with symptoms, as this much better shows the differences, alternatively use pictures</li> </ul>

### Tuesday:

Theme	Subjects to be covered
Weed biology	<ul style="list-style-type: none"> <li>• Information about weed biology focusing on the important differences between species, making them problematic</li> </ul>
Monitoring and forecasting	<ul style="list-style-type: none"> <li>• Present the background and potentials of performing monitoring and forecasting</li> <li>• Give examples of available methods and damage thresholds</li> <li>• Show how to do it in practice</li> </ul>
Decision support systems and spatial distribution of pests	<ul style="list-style-type: none"> <li>• Introduce the DSS concept, why is it a relevant method to reduce the pesticide input?</li> <li>• Give example of experimental results + results from “real life”</li> <li>• Give an overview of relevant available DSS (e.g. in Denmark Crop Protection Online should be presented)</li> <li>• Introduce the importance of spatial distribution of pests</li> </ul>
Weed identification:	<ul style="list-style-type: none"> <li>• If possible use live plants, as this much better shows the differences, alternatively use pictures</li> </ul>
Decision support systems and spatial distribution of pests	<ul style="list-style-type: none"> <li>• Let the participants experience/explore the available DSS-tools by themselves.</li> <li>• Give the participants relevant cases to solve using the DSS-tools</li> <li>• If possible, let the participants walk through a field and make a weed map. Alternatively use pictures</li> </ul>

## Wednesday:

Theme	Subjects to be covered
Chemical control	<ul style="list-style-type: none"><li>• Principles of chemical control</li><li>• Pesticides available for pest control and their mode of action</li><li>• Pest resistance to pesticides</li><li>• Application techniques</li></ul>
Spraying technique:	<ul style="list-style-type: none"><li>• Demonstration of various sprayer types</li><li>• Demonstration of various nozzle types.</li><li>• Perform sprayer calibration in a group</li><li>• Fill and clean a sprayer while focusing on minimization of risk of operator exposure and point source pollution</li></ul>
Pest monitoring techniques	<ul style="list-style-type: none"><li>• Prepare field practical classes to practice the different pest (arthropod pests, pathogens and weeds) monitoring techniques</li></ul>

## Thursday:

Theme	Subjects to be covered
Biological and microbial pest control	<ul style="list-style-type: none"><li>• Principles of biological control</li><li>• Natural enemies and antagonists biology</li><li>• Principles of microbial control</li><li>• Examples</li></ul>
Semiochemical-based control of pests	<ul style="list-style-type: none"><li>• Principles of semiochemical-based pest control</li><li>• Pheromones and other attractants</li><li>• Techniques: mating disruption, mass trapping, attract and kill, attract and sterilize</li><li>• Examples</li></ul>
Identification of natural enemies and pathogen antagonists	<ul style="list-style-type: none"><li>• If possible use well prepared individuals, as this much better shows the differences, alternatively use pictures</li></ul>
IPM card-game + intro to checklists:	<ul style="list-style-type: none"><li>• Play the IPM card-game with the participants to</li><li>• conclude the work of the week and get a last</li><li>• discussion on the subject</li><li>• Distribute the checklists among the participants.</li></ul>

**Friday:**

Theme	Subjects to be covered
Socioeconomic and environmental considerations of IPM	<ul style="list-style-type: none"><li>• Explain the Socioeconomic and environmental considerations of IPM</li></ul>
IPM farm management:	<ul style="list-style-type: none"><li>• This is where the participants/teachers take the lessons learned during the week and put them into a whole farming system.</li><li>• Select one the most important crop / farming system in the area</li><li>• Present the most advanced IPM program for this crop</li></ul>
IPM in practice:	<ul style="list-style-type: none"><li>• Make arrangement with a farmer using IPM based in biological / semiochemical control</li></ul>