

1-week ENDURE course in IPM

Northern European suggestion

Time	Monday	Tuesday	Wednesday	Thursday	Friday	
8.00-8.45	What is IPM?	Resistance management	Disease/Pest biology and natural enemies	Chemical control and IPM	Non-chemical control methods and tools	
8.45-9.30	Crop rotation and IPM				Monitoring and forecasting	Identification of pests and diseases
9.45-10.30		Weed biology	Decision support systems			
10.30-11.15	Weed biology	Decision support systems				IPM-card game + intro to checklists
11.30-12.15	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
12.15-13.00	Weed identification	Decision support systems/weed mapping	Continued identification exercise	Setting up a spraying exp.	Mechanical weed control	
13.00-13.45		Decision support systems and weed mapping		Spraying technique		Biological control in practice
14.00-14.45						
14.45-15.30						

: Theoretical session

: Practical session/Group work

: Visits

Suggested content of the course and possible input from ENDURE

Monday:

Theme	Subjects to be covered	Input from ENDURE
What is IPM?	<ul style="list-style-type: none"> • Start e.g. with the general approach from the IOBC-guidelines • Focus the introduction on the 8 principles in the EU framework directive on sustainable use of pesticides • Talk about economy and economic thresholds 	<ul style="list-style-type: none"> • The ENDURE IPM Training Guide (SA1.1)
Crop rotation and IPM:	<ul style="list-style-type: none"> • Present the use of crop rotations to minimize the problems (and pesticide use) in the field. • Talk about the differences between winter crop based crop rotations and rotations with increasingly use of alternatives 	<ul style="list-style-type: none"> • All outputs from the RA2-groups, e.g. leaflets and articles
Weed biology:	<ul style="list-style-type: none"> • Information about weed biology focusing on the important differences between species, making them problematic 	
Weed identification:	<ul style="list-style-type: none"> • If possible use live plants, as this much better shows the differences, alternatively use pictures 	<ul style="list-style-type: none"> • Use the example from SA1.1 to build this exercise



Tuesday:

Theme	Subjects to be covered	Input from ENDURE
Resistance management:	<ul style="list-style-type: none"> • Start with an overview of what resistance actually is, why it is problem and why it spreads • Preventive measures • The use pesticides with different modes of action • Implementation of a varied crop rotation 	<ul style="list-style-type: none"> • Case study leaflets
Monitoring and forecasting:	<ul style="list-style-type: none"> • Present the background and potentials of performing monitoring and forecasting • Give examples of available methods and damage thresholds • Show how to do it in practice 	
Decision support systems:	<ul style="list-style-type: none"> • Introduce the DSS concept, why is it a relevant method to reduce the pesticide input? • Give example of experimental results + results from “real life” • Give an overview of relevant available DSS (e.g. in Denmark Crop Protection Online should be presented) • Include also DSS on arthropod pests and other pathogens, if available 	<ul style="list-style-type: none"> • Knowledge and outputs of IA2
Decision support systems/weed mapping	<ul style="list-style-type: none"> • Continued introduction to DSS and • Present the concept of weed mapping and give examples 	
Decision support systems and weed mapping:	<ul style="list-style-type: none"> • Let the participants experience/explore the available DSS-tools by themselves. • Give the participants relevant cases to solve using the DSS-tools • If possible, let the participants walk through a field and make a weed map. Alternatively use pictures 	<ul style="list-style-type: none"> • Use information from the Training Guide

Wednesday:

Theme	Subjects to be covered	Input from ENDURE
Disease/Pest biology and natural enemies:	<ul style="list-style-type: none"> • Characteristics of diseases and pests in agriculture • Introduce the biology of natural enemies where relevant (predators, parasitoids and antagonists) 	<ul style="list-style-type: none"> • Eurowheat, Euroblight • Concrete information from the Case studies within ENDURE
Identification of pests and diseases:	<ul style="list-style-type: none"> • Give examples of the most common pests and diseases found in the field • Show how to distinguish the different problems in the field • Show different tools to identify pests 	<ul style="list-style-type: none"> • If relevant, use examples on exercise structure available in the IPM Training Guide
Continued identification exercise:	<ul style="list-style-type: none"> • Let the participants go into the field (if possible) and identify weeds, pests, diseases and natural enemies. • Alternatively make practical exercises in a greenhouse or similar. • Learn the participants to separate the important problems from the unimportant (with the objective of learning them the ability to assess when a problem is big enough to be controlled) 	<ul style="list-style-type: none"> • The network should be able to point towards important information regarding: • Identification keys • Info on building the exercise • Thresholds and a guide on how to assess if they are exceeded



Thursday:

Theme	Subjects to be covered	Input from ENDURE
Chemical control and IPM:	<ul style="list-style-type: none"> • Explain how chemical control can be a part of IPM • Choice of (low) dose • Anti resistance strategies • Show experimental results of using low doses (compare with neighboring countries) 	<ul style="list-style-type: none"> • Outputs from the system case studies (RA2)
Application techniques:	<ul style="list-style-type: none"> • How to choose the right technique to the job • Give an update on the latest knowledge concerning nozzle types, choice, angled nozzles etc. • Calibration of sprayers • Sprayer types • Filling and cleaning of sprayers • Point source pollution 	<ul style="list-style-type: none"> • The network should be able to point out the experts and newest information
Setting up a spraying experiment:	<ul style="list-style-type: none"> • If the participants are advisors, show them various ways to make visualizations of pesticide efficacy, including logarithmic spraying etc. • If the participants are farmers, show them how to make small scale experiments in their fields (spraying windows etc.) 	<ul style="list-style-type: none"> • Information in the ENDURE IPM Training Guide
Application techniques:	<ul style="list-style-type: none"> • Demonstration of various sprayer types • Demonstration of various nozzle types. • Perform sprayer calibration in a group • Fill and clean a sprayer while focusing on minimization of risk of operator exposure and point source pollution 	<ul style="list-style-type: none"> • Information in the ENDURE IPM Training Guide



Friday:

Theme	Subjects to be covered	Input from ENDURE
Non-chemical control methods and tools:	<ul style="list-style-type: none"> • Explain the efficiency of the available alternative methods and measures (and show results): • Soil cultivation • Mechanical weed control • Inter-row cultivation • Stale seedbed • Harvest strategy • Biological control • Microbial control • Semiochemical-based control • Cultural control • Others 	<ul style="list-style-type: none"> • Using the knowledge on innovative strategies in RA2
IPM farm management and systems:	<ul style="list-style-type: none"> • This is where the participants/teachers take the lessons learned during the week and put them into a whole farming system. • Discuss relevant cropping systems and/or farming systems • Also discuss the different possibilities and constraints in terms of (socio)-economic and environmental considerations 	<ul style="list-style-type: none"> • Relevant outputs from the RA activities
IPM card-game + intro to checklists:	<ul style="list-style-type: none"> • Play the IPM card-game with the participants to conclude the work of the week and get a last discussion on the subject • Distribute the checklists among the participants. 	<ul style="list-style-type: none"> • Relevant section of the ENDURE IPM Training Guide
Mechanical weed control:	<ul style="list-style-type: none"> • If possible, take a walk in the field and discuss the various available options for mechanical weed control. • Invite dealers with machinery to talk about the equipment and pros and cons. • If the season allows it, test the machinery to see the differences in effect. 	
Biological control in practice:	<ul style="list-style-type: none"> • Make arrangement with a farmer using biological control • If it is not possible to find a farmer, try orchards, greenhouses or similar, where biological control is more widespread 	