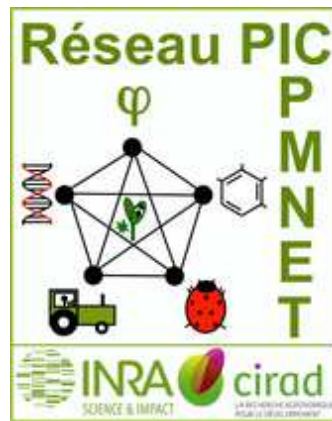# Summer School 2016

The role of IPM in mitigating pest development under climate change–modelling approaches

Objectives

- Present up-to-date knowledge on climate change and its impact on crops and pest dynamics
- Present the conceptual and methodological principles of various modelling approaches
- Illustrate how modelling can be used to help design IPM strategies for future climate scenarios
- Give hands-on experience in a class modelling project that will test IPM strategies under climate change

Program

Day 1.

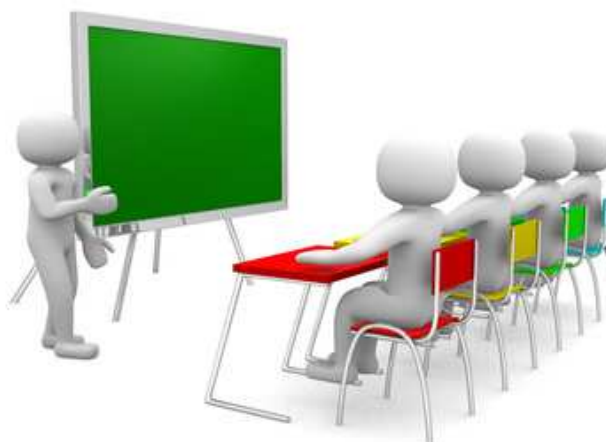| Start	Duration (min)	Climate Change, crops, pests and models	Who
8h30	10	Welcome and introduction to the Summer School	Camilla Moonen
8h40	50	Introduction: presentation of the program, pedagogical objectives, lecturers and participants	Jean-Noël Aubertot
9h30	60	Global warming: certainties and uncertainties. Part 1	Katia Laval
10h30	30	Coffee break	All
11h00	30	Global warming: certainties and uncertainties. Part 2	Katia Laval
11h30	30	Impact of Climate Change on crops	Til Feike
12h00	30	AgMIP and the role of model ensembles in modelling	Daniel Wallach
12h30	60	Lunch	All
13h30	30	Why modelling? Conceptual modelling	Jean-Noël Aubertot
14h00	30	Introduction to system models	Daniel Wallach
14h30	30	Which models for which objectives of IPM in the context of Climate Change?	Jean-Noël Aubertot
15h00	60	Effects of Climate Change on pest development and spread. Implications for IPM	Jay Ram Lamichhane
16h00	30	Coffee break	All
16h30	30	General discussion on the effects of Climate Change on pest dynamic and mitigation	All
17h00	90	Phenology model of insect (carrot Weevil). Description and practical work with R to help design IPM strategies for future climate	François Brun
18h30	0	End of day	

Day 2.

Start	Duration (min)	Methods for modelling + starting projects	Who
8h30	90	Projects: definition of objectives	All
10h00	30	Model evaluation	Daniel Wallach
10h30	30	Coffee break	
11h00	90	Sensitivity and uncertainty analyses	Mark Szalai
12h30	60	Lunch	All
13h30	30	How to get weather and pest data?	François Brun
14h00	30	Dimensional analysis	Jean-Noël Aubertot
14h30	60	Parameter estimation. Part 1	Daniel Wallach
15h30	30	Coffee break	
16h00	60	Parameter estimation. Part 2	Daniel Wallach
17h00	90	Projects: conceptual modelling, planned work, short presentation to all	All
18h30	0	End of day	

mar.

12 ° 3 °

Day 3.

Start	Duration (min)	Modelling applications for IPM under CC + Projects + Volterra	Who
8h30	45	Impact of climate change on *septoria tritici* (Septolis). Toward IPM strategies for future climate	Daniel Wallach
9h15	45	Weed modelling example using lattice	Mark Szalai
10h00	30	The qualitative modelling IPSIM platform to predict injury profiles. Application to disease management under future climate	Jean-Noël Aubertot
10h30	30	Coffee break	All
10h30	45	How to use lattice models, spatial and temporal models to help design IPM strategies for future climate	Mark Szalai
11h15	75	Projects: group work	All
12h30	60	Lunch	
13h30	90	Projects: group work	All
15h00	150	Visit of the Etruscan city of Volterra	All
17h30	120	Free time in Volterra	All
19h30	150	Social dinner	All

mer.

16 ° 7 °

Day 4.

Start	Duration (min)	Crop and pest interactions + Projects.	Who
8h30	30	Integrating pests into crop models	Til Feike
9h00	60	Integrating pests into crop models	Marcello Donatelli
10h00	30	The XPEST modelling platform to design online damage models	Jean-Noël Aubertot
10h30	30	Coffee break	
11h00	60	2nd model example. SEIR model of disease (brown rust). Description of the Zadoks model, large scale simulation and practical work with R to help design IPM strategies for future climate	François Brun
12h00	30	Integration and extensibility: practical aspects in software design and development	Marcello Donatelli
12h30	60	Lunch	
13h30	120	Projects: group work	All
15h30	30	Coffee break	
16h00	150	Projects: group work	All
18h30	0	End of day	

Day 5.

Start	Duration (min)	Project presentations and summer school wrap-up session	Who
8h30	105	Presentation of results of the modelling projects	All
10h15	15	Coffee break	All
10h30	60	Presentation of results of the modelling projects	All
11h30	30	Wrap-up session of the summer school	All
12h00	45	Lunch	All
12h45	0	Departure from Volterra and arrival at Pisa Airport 14.15	All

Presentation of lecturers and participants...

The role of IPM in mitigating pest development under climate change–modelling approaches