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SWIM (Sustainable Water Integrated Management) DEMONSTRATION PROJECT Water and Climate Change

ACLIMAS – TRAINING COURSES

Advanced tools to predict water stress and its effect on the yield of field crops

Hammamet (Tunisia), Hotel Lemdina, 24-27/11/2014

Beneficiaries: Engineers, technicians, agronomists and field crops specialists.

Organizers: ACLIMAS SWIM-DP (INAT, IAMB, CMCC)

Topics to be covered: water scarcity and agricultural water saving in the Mediterranean; water management strategies and crop response to water; water stress monitoring tools; crop and soil water balance; real-time computer applications for data management.

Indicative program and contents

First day (Monday 24 Nov. 2014)				
Morning	10:30 – 12:30	Registration of participants and general introduction to the purpose and context of the training		Khriji (INGC) Ben Mechlia (INAT)
Midday	12:30 – 15.00	Lunch break		
Session 1 –Crop and soil management under water scarcity (rapporteur: Dorsaf)				
Afternoon	15:00 – 15:30	Coping with water scarcity in the Mediterranean	General overview of main agricultural water challenges, in the context of climate change	Ben Mechlia (Français)
	15:30 – 16:00	Water conservation and saving: concepts and indicators	Water use, consumptive use, beneficial use, wastes and losses, efficiency indicators	Ben Mechlia (Français)
	16:00 – 16:30	Water saving and Water Use Efficiency	Concepts and examples (in relation to irrigation management)	Lasram (Français)
	16:30 – 17:00	Crop response to water: functions and monitoring tools	Description of water-yield production functions, and possible monitoring tools	Lasram (Français)
	17:00 – 17:30	Discussion		



Second day (Tuesday 25 Nov. 2014)				
Session 2- Crop-soil water balance: concepts and applications (FAO 56 model) (rapporteur: Radhouane)				
Morning	9:30 – 10:00	The FAO-56 approach for crop water requirements	FAO-56 approach and main components of the crop-soil water balance (ET, RO, CR, DP)	Masmoudi (Français)
	10:00 – 10:30	Reference evapotranspiration (ET _o)	Input weather data and methods to estimate ET _o , with examples of application in Mediterranean	Masmoudi (Français)
	10:30 – 11:00	Crop evapotranspiration (ET _c)	Input crop parameters and methods to estimate ET _c (single and dual K _c approach)	Masmoudi (Français)
	11:00 – 11:30	Coffee Break		
	11:30 – 12:00	Soil water balance and crop stress	Input soil parameters and calculation of soil water depletion and crop stress	Bousselmi (Français)
	12:00 – 12:30	FAO-56 model: examples and applications	Cropwat model: data input and analysis, parameters selection, graph plotting and simulating different irrigation regimes	Bousselmi Lasram (Français)
	12:30 – 13:00	Discussion		
Midday	13:00 – 15:00	Lunch break		
Session 3- Climate Change (rapporteur: Dorsaf)				
Afternoon	15:00 – 16:00	Climate change: North of Tunisia	Definition, trends and methods of down scaling	Trabucco (Anglais) Angar (Français)
	16:00 – 17:00	Crop response to water: monitoring tools	Use of remote/ proximate sensing and vegetation indices for water stress and yield prediction	Trabucco (Anglais) Angar (Français)
Third day (Wednesday 26 Nov. 2014)				
Session 4- New technologies to support farm irrigation management: the HydroTech project(rapporteur: Bousselmi)				
Morning	9:30 – 10:00	Irrigation scheduling: approaches and strategies	Introduction to irrigation scheduling methods and full/deficit irrigation strategies	Todorovic, Buono (Anglais) Angar (Français)
	10:00 – 10:30	The HydroTech (HT) project in Southern Italy	Integration of modelling, sensors and remote control: an overview of the HT approach	Todorovic, Buono (Anglais) Angar (Français)
	10:30 – 11:00	ICT solutions for data management	Web services, data acquisition, design of Web and App applications	Todorovic, Buono (Anglais) Angar (Français)
	11:00- 11:30	Coffee Break		
	11:30 – 13:00	Input data, field calibration and examples of farm applications	Input data quality and parameters estimation, crop phenology and sensitivity to water stress. Examples of applications (orchards, grapes and field crops)	Todorovic, Buono (Anglais) Boussalmi (Français)
Midday	13:00 – 15:00	Lunch break		



Session 5- Crop response to water stress: eco-physiological research and proximate sensing techniques (rapporteur: Gharbi)				
Afternoon	15:00 – 15:40	Eco-physiology and agrometeorology at CIHEAM-MAIB experimental station	General introduction to fundamental research equipments (on-field weather sensors, porometer, LICOR 6400, etc.)	Ranieri (Anglais)
	15:40 - 16:20	Crop Water Stress Index (CWSI): examples and applications	Use of thermal camera and computer work (Excel program): data input, graph plotting, evaluation of the level of water stress (with examples)	Buono (Anglais) Ranieri (Anglais)
	16:20 – 17:00	Capacitance sensors: principles, calibration and field use	Use of capacitance sensors for soil water monitoring and irrigation management (with examples)	Buono (Anglais) Ranieri (Anglais)
Fourth day (Thursday 27 Nov. 2014)				
Session 6 – Adaptation to Climate Change (rapporteur: Ben Mechlia)				
Morning	9:30 – 11:00	Water conservation and saving: dry-land agriculture	Crop-soil management techniques to limit water stress and for water conservation	Nsiri / Gharbi (Français)
	11:00-11:30	Coffee Break		
	11:30 – 12:30	Water conservation and saving: irrigated agriculture	Demand management, improving application efficiency of irrigation methods	Bousselmi/Angar (français)
	12:30 – 13:00	Ecological zoning and Variety adaptation	Climate indices, cereal varieties, legumes..	Gharbi/Dorsaf (français)
Midday	13:00 – 14:00	Lunch break		
Afternoon	14:00 – 16:00	Final discussion and conclusions		Ben Mechlia/Khriji