



IRTA
UCDAVIS

International Course on Irrigation

Lleida (Spain). October 5-9, 2015

IRTA the Institute of Agriculture and Food Research and Technology of the Catalan Government and the University of California Davis jointly organize the first edition of the one week IRTA-UCDavis International Course on Irrigation, which will take place in Europe.

Objectives

The objective of the course is to provide the elements that are required in the operation of an irrigation system so that efficiency of plant water use and the efficacy of the system in delivering water are maximized. This is a complex problem since crops grow under varied combinations of soil, weather and growing conditions. Guiding principles in how to deal with these changing environmental factors will be provided.

The course is designed to deal in depth on fruit tree species but most of the principals will also pertain to annual crops.

Attendees and Format

The course is addressed to irrigation managers and highly specialized technicians who have irrigation management responsibilities.

From the perspective of a world with dwindling water supplies there is currently great need to make strategic irrigation decisions considering the underlying principles that control water use at an orchard level with awareness of their implications for crop production.

This course assembles a group of highly experienced scientists with extensive careers in the field of fruit tree growth and irrigation management. The schedule of the course covers principles of irrigation management not only from a theoretical but also an applied point of view. The activity will last 5 days and includes five different types of lectures:

- **Short theoretical sessions of 30-45' covering a total of 24 different topics**
- **Workshop exercises of 60' each covering a total of 6 different topics**
- **Demonstrative laboratory training sessions covering 5 different topics**
- **Afternoon field trip**
- **Discussion sessions between the instructors and the students at the end of each day**

Benefits

Students enrolled in the course will gain a fundamental understanding of how water moves through the soil, into and through the plant, the critical periods when plant growth and productivity are most affected by the lack

of water, and modern irrigation techniques for optimizing use and delivery of water to meet crop needs. This knowledge is essential for managing irrigation systems in an era of diminishing water resources.

The course will also provide a unique opportunity to interact with and discuss all aspects of orchard irrigation management with scientists and practitioners who have spent the majority of their professional careers dealing with multiple aspects of plant water use and irrigation management in orchards and vineyards.






































Venue

The course will take place in the lecture rooms of PCITaI, Parc del Gardeny and IRTA Fruitcentre premises in Lleida (Spain) from 5th to 9th October 2015. Attendees are advised to arrive the night before the beginning of the course. Please have in mind that there are special hotel rates available for the participants.

Lleida is a very well connected modern city in the heart of Catalonia, with direct train connections from Barcelona and Madrid, a vibrant life and a remarkable relation with high-end agricultural production.

Course Schedule

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	Monday	Tuesday	Wednesday	Thursday	Friday
08:30-09:00	 Registration	 Quiz	 Quiz	 Quiz	 Quiz
09:00-09:30	 Lecture Course introduction and description of the different disciplines (T01)	 Lecture Soil plant atmosphere continuum (T04)	 Lecture Water production functions (T07)	 Lecture Irrigation strategies (Full irrigation, RDI, SSDI, Supplemental Irrig) (T09)	 Lecture The problem of spatial variability and irrigation sector design (T16)
09:30-10:15	Agronomic and hydraulic design (T02)	Evaluation of plant water status (T05)	Carbon acquisition and inter-organ competition (T08)	Irrigation particulars in <i>Drupacea</i> species (T10)	Applications of remote sensing to irrigation (T17)
10:15-10:45	Soil physical properties (T03)	Irrigation requirements (T06)	Seasonal sensitivity to water stress (T09)	Irrigation particulars in <i>Pomacea</i> species (T11)	Automated control of irrigation (T18)
10:45-11:00	 Coffee break	 Coffee break	 Coffee break	 Coffee break	 Coffee break
11:00-12:00	 Hands-on exercise: Soil hydraulic properties by using different soft (E01)	 Hands-on exercise: Predicting plant water potential (E03)	 Hands-on exercise: Predicting yield responses from seasonal water stress (E05)	 Lectures continued Irrigation particulars in almond (T12) Irrigation particulars in other nuts (T13)	 Lectures continued Irrigation in citrus (T19) Irrigation particulars in annual crops (T20)
12:00-13:00	Homogeneity of pressures in the irrigation system (E02)	Irrigation scheduling techniques (ETo, SWP, SWC) (E04)	Productive response to applied water and irrigation systems (E06)	Irrigation particulars in olive (T14) Irrigation particulars in grapevine (T15)	Optimization of water resources (drought) (T21) Interactions with mineral fertilization (T22)
13:00-14:00	 Lunch	 Lunch	 Lunch	 Lunch	 Lunch
14:00-15:00	 Field laboratory exercise Measuring of soil retention curves	 Field laboratory exercise Measuring tree water stress	 Field laboratory exercise Linking water stress with stomatal conductance and leaf photosynthesis: an experimental evaluation.	 Field laboratory exercise  Field trip	 Lecture Interactions with crop techniques (T23) Miscellaneous and concluding remarks
15:00-16:00	Water meters management	Using DSS for estimating irrigation requirements			
16:00-17:00	 Final discussion with instructors	 Final discussion with instructors	 Final discussion with instructors	 Final discussion with instructors	 Final discussion with instructors
				 Graduation Dinner (20:00-22:00)	

International Course on Irrigation / Instructors

This course assembles a group of highly experienced international scientists with extensive careers in the field of fruit tree growth and irrigation management.

Joaquim Bellvert

Dr. Joaquim Bellvert is a researcher at IRTA. He is currently doing a Postdoc at the CSTARs lab, UC Davis. His research focuses on the use of remote sensing for improved irrigation water use efficiency and productivity in heterogeneous crops. So as to perform such investigation, he uses high resolution airborne multispectral and thermal imagery to detect within-field spatial variability in water requirements, and plant water stress.

Jaume Casadesus

PhD in Biology (University of Barcelona, 1995) and Computer Engineer (Open University of Catalonia, 2007). He has worked as a qualified technician at the University of Barcelona (1996-2000) and as a researcher at IRTA (2001-2014). He is specialized in the development of ICT solutions to agricultural and environmental problems. His current research line deals with algorithms for the unmanned interpretation of soil sensor data and their usage in automated scheduling of irrigation.

Ted M. DeJong

Professor of Plant Physiology and Cooperative Extension Pomologist in the Department of Plant Sciences, at the University of California Davis. His areas of expertise include tree crop physiology, crop modeling, management of fruit tree crops, carbon partitioning, peach rootstock development and dried plum breeding. He is specialized in crops and particularly in peaches, nectarines, plums, almonds and prunes.

Elias Fereres

Dr. Elias Fereres is professor of Agronomy at the University of Cordoba and researcher at the Institute for Sustainable Agriculture, CSIC, in Cordoba, Spain. He is currently the Chief Editor of the Irrigation Science journal.

Joan Girona

Researcher at IRTA for more than 30 years. He is currently the head of the Efficient Use of Water Program at IRTA. His main interests are related to irrigation management under limited available water conditions, seasonal sensitivity of woody species to water deficits and how to apply these approaches in commercial orchards and vineyards.

Steve Grattan

Dr. Grattan has been at the University of California Davis for over 30 years. He has a PhD from UC Riverside in Soil Science with a minor in Plant Physiology. His area of research specialization deals with salinity effects on plants at the plant and field scale; uptake of nutrients, salts and trace elements by plants grown in saline environments and management with saline water.

Bruce D. Lampinen

Dr. Bruce Lampinen is a Specialist in Cooperative Extension in the Plant Sciences Department at the University of California Davis. His research program focuses on almond related production issues with an emphasis on irrigation and canopy management. Current and previous research has included work on

canopy management in high density orchards, canopy size impacts on orchard water requirements, the effects of irrigation and nitrogen on spur longevity and productivity in almond, and alternatives to methyl bromide for nursery and orchard replant situations. Much of this work is being quantified by means of a recently developed automated mobile platform for measuring canopy photosynthetically active radiation interception by tree canopies.

Jordi Marsal

Irrigation scientist at IRTA, he is currently part of the Efficient Use of Water Program. His background includes the evaluation of whole plant physiological responses to water deficit. During the last years his study has been focused on quantifying such responses to produce a modeling framework that can be used from an irrigation management perspective.

Josep Rufat

Researcher at IRTA, at the Efficient Use of Water Program. He is specialized in irrigation management and fertilization in plants, mainly in fruit trees, such as peaches, nectarines and apples, and also in olive trees.

Ken A. Shackel

Professor Shackel teaches soil/plant/water relations and environmental crop physiology at the University of California Davis, and conducts research on tree and vine responses to water stress and Regulated Deficit Irrigation (RDI) under field conditions, fruit growth, and pre- and postharvest fruit water relations.

Cost

The course fee is **2500€** and includes tuition, documentation (syllabus), lunches, coffee breaks, field trips, ground transportation from hotels to the venue, and graduation dinner.

Sign up soon for place reservation!

So as to ensure the quality of the course, there are **only 20 places available** that will be covered on a very strict first-come, first-served application basis.

Please make sure to send an email to:

international@irta.eu

in order to reserve your place.

Certificates

Attendees who complete the course will receive a **certificate of attendance** issued by the course organizers.

Payment

Payment by bank transfer must be made to the following account:

BANCO DE SABADELL, Oficina Banca Corporativa 5172

Avenida Diagonal, 407 Bis, planta 2ª. Barcelona (08008)

IBAN ES73 0081 5172 82 0001052013

SWIFT BSABESBB

Remember to indicate the reference:

irrigation2015 + your name

Finally, please make sure to send a copy of the wire transfer receipt to the email **international@irta.eu** so as to confirm your registration.

If there are any bank expenses they are charged to the student.

Payments must be received before the beginning of the course.



 **Generalitat de Catalunya**
Government of Catalonia



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