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Project title: 13th World Water Congress – Montpellier 1 – 4 September 2008
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Unit managing the project: LISAH (Laboratory for soils, agrisystems, hydrosystems interaction studies) (INRA, IRD, Montpellier SupAgro)

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Countries involved in the project: Australia, Tunisia

Research units from the Foundation's scientific network involved: AGAP, DIADE, ECO&SOLS, EMMAH, GREEN, INNOVATION, LEPSE, PSH, SYSTEM.

Subthematic axes: IPB-1 (Integrative Plant Biology 1: *Genetics and genomics, plant breeding, ecophysiology*), IPB-2 (Integrative Plant Biology 2: *Plant pests and diseases, integrated crop protection, population ecology*), STDI-1 (Socio-Technical Dynamics of Innovation 1: *Agri-environmental innovations, agri-ecosystems, resources management*), STDI-2 (Socio-Technical Dynamics of Innovation 2: *Agrifood innovations, food and non-food use of plant crops*), STDI-3 (Socio-Technical Dynamics of Innovation 3: *Innovation processes, social management of innovations*)

Objectives:

The aim of the 13th World Water Congress, held under the aegis of the International Water Resource Association (IWRA) at the Corum in Montpellier from 1 to 4 September 2008 was to make a contribution to knowledge on the impact of global climate change on water resources and to improve awareness by civil societies. It was a unique opportunity to stimulate discussion between public and private partners, between users and decision makers and between developing, emerging and developed countries. The Congress organised numerous high-level lectures, ordinary scientific sessions, special sessions, poster sessions, technical displays (equipment, books and journals) and technical visits.

The project supported the organisation of the congress. Agropolis Fondation made a contribution to the overall congress budget and to the organisation of a special session on themes of interest to the scientific units backed by the Fondation.

The main theme chosen for the Montpellier congress was 'Global changes and water resources: confronting expanding and diversifying pressures'. It was open to all water stakeholders: scientists, local authorities, industry, associations, international organisations, etc.

Special operations brought the theme to the general public and young people: an exhibition called 'Water for Everyone' (*Cité des Sciences et de l'Industrie*), lectures, drawings and painting, shows, a festival of short films, etc.

Action carried-out and results obtained:

To provide an overview of the most advanced research programs in agricultural sciences that attempt to answer the previous issues and to stimulate discussion on the most promising perspectives a special session was organised with the support of Agropolis Fondation during the World Water Congress that took place in Montpellier in September 2008. The congress has attracted specialists in water sciences from around the world. The research topics that were addressed in the special session concerned plant breeding, cropping system innovation and land management innovation and optimization.

The session consisted of 5 keynote talks followed by a general discussion introduced by three discussants.

Keynote talks

1. Breeding crops for drought: How to develop water-efficient and drought tolerant cultivars. Perspectives and limits. Speaker: François Tardieu, INRA, UMR LEPSE, Montpellier
2. Designing crops for improved water productivity – Modelling G*M*E. Speaker: Graeme HAMMER, University of Queensland, Australia.
3. Optimization of cropping systems for sustainable water management in rainfed and irrigated systems: Integrative modelling at field and farm levels. Speakers : Jacques-Eric Bergez, INRA UMR AGIR, Toulouse, France, François Affholder CIRAD, Montpellier, France
4. Water harvesting techniques at the field and catchment level: State of art and new research challenges. Speakers: Jean Albergel, IRD, UMR LISAH, Nairobi, Kenya and Nathalie Gomes, IRD, Kenya
5. Participative modelling of agricultural water demand at regional scale: Aan example in Central Tunisia. Speakers : M. Le Bars, IRD, UMR G-EAU, Montpellier, France); Ph. Le Grusse, CIHEAM-IAMM, UMR G-EAU, Montpellier, France

Open discussion

Discussants: Australia: Graeme HAMMER, University of Queensland - France, Bernard Itier, INRA, Grignon - Tunisia: Netij Ben Mechlia, INAT, Tunis

Moderators : Jacques Wery, SupAgro, UMR System, Montpellier, France - Thierry Simonneau, INRA, UMR LEPSE, Montpellier, France

In contrast to the talks which focused each on the issues and perspectives of given research approaches for improving water use and management approaches in cropping systems, the general discussion aimed at comparing and evaluating the respective merits and potentials of the various research approaches in different regional contexts. To this aim three discussants from Australia, France and Tunisia introduced the discussion by presenting which are the main issues related to water availability and water efficiency for crop production in their country and what are the current research perspectives that are considered the most promising.

The session has allowed to identify some key research issues from which future collaboration of agronomists, hydrologists and economists can be developed:

- 1) Transition from component to system design. Soil and plant and water studies should converge with integrated studies to look for optimal combinations of Genotype X Crop Management X Water Management maximising production and environmental services under specific water deficit scenarios (combining climate and soils).
- 2) Transition from Sectoral/Scale specific studies to Integrated Assessment across scales in order to design sustainable water management systems in agricultural regions. Among the issues discussed were the following:
 - comparison of strategies (genetics, crop successions, water harvesting...) for water saving, water use efficiency or water productivity
 - multicriteria assessment of these solutions at relevant scales
 - design of systems providing resilience through crop diversity and flexibility in water management
 - design of systems based on risk assessment and climate forecasting
- 3) Role and methods of models adapted to these objectives with emphasis on the following aspects:
 - Integrated modelling across scales and sustainability dimensions and thereby across disciplines
 - Targetted models for specific uses and users

- Organisation of data collection and sharing among disciplines

Prospects for the future:

Multidisciplinary projects that aim to follow and implement the main conclusions of the special session in terms of research needs may be prepared in the future. The Agropolis Fondation units that supported the organisation of this special session as well as the foreign invited speakers are potential partners of such projects. This initiative may be integrated within the framework of a larger research program that aims to study the changes of Mediterranean continental ecosystems under climatic and anthropic pressure (SICMED) which is currently being set up by INRA, IRD and INSU.

Total Agropolis Fondation funding: € 12,632 (registration fees, travel expenses and accommodation costs for 10 speakers)

Funding categorie(s): Agropolis Fondation small grants (support for the organisation of high-level scientific events (conferences, seminars))

Project duration: January 2 2008 – November 30 2008

Keywords: water – symposium – conference – climate changes