

# INTERDROUGHT 2022

THE 7<sup>TH</sup> CONGRESS ON PLANT PRODUCTION IN  
WATER-LIMITED ENVIRONMENT

FIRST TIME IN AFRICA !

28 NOV. - 02 DEC. 2022

King Fahd Hotel, Dakar, Senegal



## FOUL PROGRAM DETAILS

Water will be a major limitation to food production in the 21<sup>st</sup> century, and drought issues already prevailing in many parts of the world being further emphasized by the rapid changes of climate. This edition of the International Interdrought Conference, the first one on the African continent, comes at the right time, Africa being foreseen at the continent that will suffer the most from climate change. Its purpose is to continue the rich exchanges and debates that have characterized the previous editions of the conference, continuing on a very multi-disciplinary approach, keeping on a global view on drought issues, and largely including climate change issues. The key disciplines of physiology, genetics and molecular biology are integrated across sessions that target specific aspects of plant production in water-limited situations/ systems. It is important also, while keeping a global perspective on drought, that this first edition of Interdrought on the African soil be able to reflect on the issues around drought in an African / small holder context. The following program proposal is an attempt to build up on the

previous editions while reflecting the evolution in research and knowledge and addressing this particular African case.

### **Session 1: Combating drought: a multi-dimensional challenge**

- – This session aims at a broad view on drought issues (on climate change, soil, global water reserves, etc...).

**1a- The first key note** will look at drought from the lens of small holder / African farming system, in a context of absence of safety nets (banks, credit/insurance systems, etc...), the general lack of infrastructure, the question of input (even in dry environment, the need to adopt / improve agro-ecological practices, may be including something on the climate variability (e.g. the drought of the 70's in the Sahel, the consensual gloomy predictions on rainfall in the Sahel).

**1b – The second key note** will update the audience on the genetic gains and breeding progress that have been made to deal with drought, reflecting on the current initiatives, the place for new breeding techniques such as genomic selection, the role of the private sector, the role of farming communities.

**1c – The third key note** will look at the water issue globally, reflecting on green vs blue vs grey water issues, looking at future scenarios for agriculture water (e.g. looking at crop water foot print) versus water used for industrial and domestic development, looking at the management of water going beyond agriculture.

**Session 2: Maximizing water access / availability to plant**

This session will review the recent advance in root research but will go beyond roots and will more broadly address the question of soil water availability to the crop. It would tackle the forthcoming trends of less frequent rains with higher intensities, the need to maximize soil recharge, the optimization of plant – soil - microbiome interactions and the associated biophysics and genetics, and the enlargement of soil water bank by soil fertility improvement. Compared to earlier Interdrought's, this session enlarges the scope from “root/water capture” from the previous editions to “maximizing soil water supply to crops”.

**Session 3: Increasing water use efficiency with a crop focus –**

This session has a plant / crop physiology/ breeding perspective and focuses on the mechanistic aspects that drive the productive processes in the plants, from those driving efficiency aspects, to those driving growth, light capture and senescence, and to those driving crop phenological development, providing insight on genotype X environment interactions at play. It then includes TE/WUE aspects, high temperature effects on reproductive growth, temperature / VPD / CO<sub>2</sub> effects on vegetative growth/productive processes, adequate crop phenology to ensure crop fitness, and water and nutrients synergy. Genetics on related traits and application of modern tools such as genomic selection will form an integral part of this session.

**Session 4: Increasing the efficiency of water use with a farm system focus** – This session has a crop / cropping system perspective and focuses on avenues to increase return on limited water. It includes dual purpose crops aspects where crop output is also fodder or ecosystemic services and adds to economic return. It goes beyond WUE/TE and also includes crop water foot print considerations in farming systems. It includes presentations on any agronomic practices, like crop association, soil mulching / conservation agriculture, crop choice (species, genotypes), that could increase WUE not only of one cropping cycle but of the entire crop/farming system over time. It touches on crop/farming system intensification aspects, which are currently a topic of interest in small holder farming but raises issues = how to intensify in a drought context and in a sustainable way.

### **Session 5: Guiding decisions from multiscale data integration and decision support systems to reduce risks**

This session tackles drought variability by different means, seeks a better understanding of variations and causes, and proposes ways to deal with and adapt to it better. The pillars of the session would be: (i) how ‘big data’ can help us deal with drought variability; (ii) how crop models can help us deal with GxExMxS interactions; (iii) how farming system models can help us take a broader view on drought in a small holder context, (iv) how to address the trade-offs between risk and reward from an economic perspective and toward decision-making. It includes tools to monitor drought in a farming context (e.g. to guide irrigation for instance or make decisions on crop

choice). It could include also work on insurance schemes to prevent farmer's bankruptcy, weather forecasting services or farm management assistance based on model predictions.

### **Session 6: Innovating to find solution to drought at scale for small holder farmers – Where we want to be 4 years from now (One keynote plus few small talks, ended by a panel discussion)**

This session is the last one and would ideally put all the pieces together from the earlier sessions. In this final session, a first part will propose a summary from the conference and the learnings from the 5 sessions. Then the discussion of the panel could be to propose possible avenues to help solve farmer's problems of uncertainty in drought-prone areas, building on the knowledge from the earlier sessions.