Sorghum in the 21st Century

Global Sorghum Conference

Resiliency and Sustainability in the Face of Climate Change

June 5-9 2023 The Corum Event Center, Montpellier, France

Lead Sponsor

Kansas State University
College of Agriculture

Supporting the

International Year of Millets 2023

BOOK OF ABSTRACTS

PROGRAM - ABSTRACTS

List of posters - List of participants
List of exhibitors - Exhibition plan

cirad · Collaborative Research on Sorghum and Millet · Sorghum ID · Sorghum the safe bet for the future · IRD Institut de Recherche pour le Développement France · CERAAS Centre d'étude régional pour l'amélioration de l'adaptation à la sécheresse

Welcome to Montpellier!

On behalf of everyone who has contributed to the organization of the conference and the development of the scientific program, we want to welcome you to ***Sorghum in the 21st Century: Resiliency and Sustainability in the Face of Climate Change***. This conference and the scientific program build upon the groundwork established in Cape Town at the 2018 conference hosted by the University of Pretoria and the Feed the Future Innovation Lab for Collaborative Research on Sorghum and Millet. The primary objective of the 2023 conference continues to align with past goals: To build relationships between producers, consumers and the research and development community around the fascinating opportunities sorghum presents to address some of the world's greatest challenges facing agriculture. It is the primary purpose of this conference to advance this dialogue and update the community about the state of sorghum science, industry, development and novel opportunities to confront climate change. We must focus on creating additive knowledge and identifying the 'known unknowns' in order to build collaborative actions that break down geographical and scientific barriers and that increase resiliency and sustainability across the sorghum value chain.

We will address this need through exciting keynote, plenary and contributed presentations, a wide range of posters and exhibits, topical symposia, and student events such as the '3-Minute Thesis' competition that will identify the best and brightest minds that will move our work forward. Special scientific visits and tours, the addition of the 'Sorghum Idea Challenge' and social events in the most wonderful southern France style will further enhance out this experience. Our geographical focus on the European Union will be an eye-opening experience for all.

This event would not have been possible without generous funding from numerous sponsors from both the public and private sectors around the world. A special thank you is extended to Kansas State University as our lead event sponsor. This conference would not have been possible without the dedication and hard work of the local and international organizing committees over the past 24 months. Truly this has been a collaborative effort from like-minded individuals and organizations from around the world.

We hope you will leave the conference renewed and energized about the monumental and societal role of Sorghum in the 21st Century!

Timothy J. Dalton
Kansas State University
Chair of the international steering and program planning committee

Jean-Francois Rami
Cirad
Chair of the Local organizing committee

Table of contents

ORGANIZERS & PARTNERS

Cirad

French Agricultural Research Centre for International Development
https://www.cirad.fr/en/

FEED THE FUTURE INNOVATION LAB

Collaborative Research on Sorghum and Millet
https://smil.k-state.edu

SORGHUM ID

Sorghum - International Development
https://www.sorghum-id.com/en/

IRD

French National Research Institute for Sustainable Development
https://en.ird.fr/

CERAAS

Centre dÉtude Régionale pour l'Amélioration de l'Adaptation à la Sécheresse
https://ceraas.org

Table of contents

COMMITTEES

International steering and program planning committee

- **Timothy Dalton (chair)** - *Kansas State University/SMIL - USA*
- **Valérie Brochet** - *SorghumID - France*
- **Kira Everhart-Valentin** - *USA*
- **David Jordan** - *University of Queensland - Australia*
- **Ndjido Kane** - *CERAAS - Senegal*
- **Jurandir Magalhães** - *EMBRAPA - Brazil*
- **David Pot** - *Cirad - France*
- **Jean-François Rami** - *Cirad - France*
- **Gilles Trouche** - *Cirad - France*
- **Vincent Vadez** - *IRD - France/Senegal*

Local organizing committee

- **Jean-François Rami (Chair)** - *Cirad - France*
- **Patricia Costeraste** - *Cirad - France*
- **Timothy Dalton** - *Kansas State University/SMIL - USA*
- **Béatrice Dhellemmes** - *Cirad - France*
- **Jacques Faye** - *CERAAS - Senegal*
- **Olivier Ginestet** - *Alpha Visa - France*
- **Martin Gomez** - *SorghumID - France*
- **David Pot** - *Cirad - France*
- **Nancy Terrier** - *INRAE - France*
- **Gilles Trouche** - *Cirad - France*
- **Christelle Vernière** - *IRD - France*

Sponsorship committee

- **Kira Everhart-Valentin (chair)** - *USA*
- **David Jordan** - *University of Queensland - Australia*
- **Olivier Ginestet** - *Alpha Visa Congrès - France*
- **Martin Gomez** - *SorghumID - France*
- **Norma Ritz Johnson** - *Sorghum Checkoff - USA*
- **Nathanael Bascom** - *Kansas State University/SMIL - USA*

Administrative secretariat

Registration, accommodation & abstract submission - Sponsorship & exhibition

Alpha Visa Congrès / Sorghum 2023
624 rue des Grèzes - 34070 Montpellier - France
Tel: +33 4 67 03 03 00
E-mail: sorghum@alphavisa.com - https://www.21centurysorghum.org

Table of contents

ACKNOWLEDGMENT

The Organizers would like to thank our sponsors and public & private partners for their support of the 2023 Sorghum in the 21st Century Global Sorghum Conference.

Lead sponsor

Kansas State University | College of Agriculture

Gold sponsors

Lidea – Fresh ideas for agriculture

Sorghum Checkoff

Alta seeds by ADVANTA

Silver sponsors

Global Collaboration for Resilient Food Systems

McKnight Foundation

Semences de Provence

CGIAR | CIMMYT International Maize and Wheat Improvement Center

Corteva agriscience

OZ Sorghum

KWS

Texas Tech University

hiphen

Seeds from Europe – Sorghum, a key to build our future.

Supporting partners

La Région Occitanie Pyrénées · Méditerranée

Université de Montpellier

agropolis fondation – Supporting agricultural research for sustainable development

Montpellier Méditerranée Métropole

Collaborative Research on Sorghum and Millet

cirad

Sorghum ID – Sorghum the safe bet for the future

iavao – Innovation et amélioration variétale en Afrique de l'Ouest

Australian Centre for International Agricultural Research | Australian Aid

The University of Queensland Australia

ARC Centre of Excellence for Plant Success in Nature and Agriculture

Table of contents

TABLE OF CONTENTS

Program

Program

ABSTRACTS THURSDAY 8 JUNE

Plenary Session

Parallel Sessions 9

Parallel Sessions 10

ABSTRACTS OF POSTERS

O12

Plant response to a late heat stress can be modified by an earlier one: a case study on sorghum grain production

Angelique Berger (angelique.berger@cirad.fr)

Aga Institut, CIRAD, Montpellier, France

Climate change is now a reality and observable effects include higher temperatures with successive periods of heat waves. These events have consequences in plant development and grain production. Sorghum is an African native cereal known for its robustness. However, in the context of climate change, sorghum production can be affected by heat stresses during reproductive stage. Even if the effects of single heat stress were already described as having an impact on sorghum grain production, the effects of recurrent heat waves were not studied until now.
A preliminary study was performed in 2021 with two contrasted genotypes grown under four heat stress scenarios in controlled conditions, combining single and recurrent heat waves. The aim of this study was to analyze i.) the effects of these stresses on plant production ii.) the eventual impact of an early heat stress on a later one. In addition to yield components analyses, morphological, spectral and biochemical measurements were performed on sorghum panicles.
Yield components, morphological traits and grain quality were differently affected depending on the stress scenario. Furthermore, our results show that an early heat stress can attenuate or amplify the response of a later one, depending on the considered variable, the genotype but also the position of the first stress compared to the second one.
New experiments are currently investigated in RICOCHETS project (2023-2026). Our original approach combines dynamics multiscale analyses with samplings at key times (early stress/recovery periods/late stress). These results will contribute to broaden our knowledge on the response of plants to recurrent heat waves, which can be used in future plant breeding programs.

Table of contents