



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

## Feed the Future Innovation Lab for Climate Resilient Cereals

JUNE 2024

### In this edition:

This edition includes a spotlight on Dr. Jacques Faye (ISRA-CERAAS), highlights from the recent trip to Ethiopia, information about the semi-annual report, and several sorghum recipes.

### Monthly Newsletter

Thank you for reading the Climate Resilient Cereals Innovation Lab Newsletter. Each month, we'll bring you exciting updates from our consortium partners while spotlighting different cereals. We will report our monthly successes and recap recent activities while giving you a sneak peek into the upcoming programming across our teams. Stay connected and informed with our newsletter as we journey towards a more resilient future together.

### Meet Dr. Jacques Faye



Dr. Jacques Faye, a Senegal native, is a researcher at the Regional Center of Excellence on dry cereals and associated crops of the Institut Sénégalais de Recherches Agricoles, : the Centre D'étude Régional pour l'Amélioration de l'Adaptation à la Sécheresse (ISRA-CERAAS). Our program is proud of his leadership as a young National Agricultural Research Institute scientist, serving as Deputy Country Lead for CRCIL Senegal. He took time to answer some questions, and to share a little more about himself this month.

#### Why is the Feed the Future Innovation lab for Climate Resilient Cereals important for Senegal

Senegal agricultural systems take place mainly in dryland areas where climate change negatively leads to annual rainfall deficiencies, delayed delays onset of growing seasons, high temperatures, and early and terminal drought stress. Therefore, developing climate-resilient sorghum, pearl millet, and wheat varieties will increase productivity and income for small-scale farmers in the country.

#### What is your role at CERAAS?

My role at ISRA-CERAAS focuses primarily on the discovery and deployment of climate-resilient trait packages, including drought tolerance, photoperiod sensitivity, and environmental factors across the north-south precipitation gradient from the Sahelian to the Guinea zones of West Africa, using forward quantitative genetics and genomics-assisted breeding approaches. My work at ISRA-CERAAS is done in close collaboration with US universities and West African breeding partners to enable the rapid deployment of climate-resilient cereal varieties to the existing breeding networks. My long-term goal is to contribute to global food security through the genetic improvement of Africa's staple food crops to increase the income of small-scale farmers regardless of climate change.

#### Where did you get your education from?

I got my bachelor's degree in Natural Sciences in 2012 and a Master's in Plant Biotechnology and Microbiology in 2014 from the University Cheikh Anta Diop of Dakar (UCAD). I started my graduate research program on crop genetics and genomics in 2016 under the Feed the Future Innovation Lab for Collaborative Research on Sorghum and Millet. I hold a PhD in Plant Breeding and Genetics from the Department of Agronomy at Kansas State University. My thesis topic was to develop genomic tools and generate knowledge to facilitate sorghum improvement-Genomics-enabled breeding for sorghum improvement in Sub-Saharan Africa.



# The Month of Sorghum

The Whole Grains Council has declared June the month of Sorghum. While not widely known in all parts of the world, it is the fifth most important cereal crop due to its drought tolerance and versatility. A popular crop grown in parts of Asia and Africa, sorghum can be used for more than just human consumption. The stalks have been used to make brooms, and in some varieties, if crushed, they will make a sugary juice used as a sweetener. Sorghum is an important climate-resilient source of nutritious food and feed for many Feed the Future countries.

## DID YOU KNOW?

- Sorghum does not contain gluten and can be used as a substitute for flour.
- You can pop sorghum like popcorn!
- Sorghum survives extreme heat, drought, and waterlogging, which makes it a popular crop.
- Leather can be dyed using different varieties of sorghum.
- Some varieties of sorghum mature in just 75 days.



Do you have a recipe that features wheat?  
Send the recipe and photo of the finished product for publication in July.

## Sorghum/Jowar Dosa

Submitted by: Dr. Latha Melmaiee, Delaware State University

### Ingredients:

- 1 part urad dal
- 1.5 part rice
- 1.5 part sorghum
- 1 teaspoon salt
- 1-2 tsp fenugreek seeds (optional)



## Getting Creative with Sorghum

Submitted by: Dr. Jacques Faye, ISRA-CERAAS

CERAAS works with a women's processing group to explore new recipes for sorghum in Senegal. They provide the sorghum, and the women try new recipes for this resilient and versatile grain. Varieties resulting from CRCIL will help ensure this and other groups will have access to reliable sorghum harvests despite climate change.



Row grain ready for processing



Partial grinding of the grain where the outer layer of the whole grain is removed



Grain is then washed and soaked in water for 30 minutes and ready for cooking

This gives us a diversity of products from sorghum.

Dr. Jacques Faye, ISRA-CERAAS



Sorghum and Fish



Bassi Guinar (Grain sorghum and chicken)

### Batter Preparation

Mix ingredients, rinse 3-4 times, cover with more water, and soak overnight. After soaking, grind into a thick pouring batter. Cover the container and ferment for 10 hours. The batter will have nice bubbles and raised in that time (During cooler months, use the proof setting in a conventional oven for successful fermentation).

### Preparing Dosa

Take a portion of the fermented batter, add a teaspoon of salt to taste (optional: a pinch of baking soda), and add some water to adjust the batter so it is easily spreadable on the pan.

Heat cast iron/nonstick griddle on medium to high burner setting; pour 1/2 cup into a hot griddle, spread it to a half centimeter thickness, drizzle some cooking oil, cook until the bottom turns to crisp (around a minute), turn the dosa upside down, cook for another side for 30 seconds.

Serve with chutney, meat, vegetables, or any sauces. The unused batter can be stored in the fridge for 10 days.

This dish is gluten-free, high in protein, and has a high fiber option with micronutrients from sorghum

# CRCIL Visits Ethiopia

Submitted by: Reed Middleton, Kansas State University

Continuing the first round of visits to NARI partners, CRCIL's ME and Advanced Science Engine visited the Ethiopian Institute of Agricultural Research (EIAR). Over four days in Addis Ababa, the group made progress on Quick Win research as well as prioritization of climate resilient traits for bread wheat and sorghum in Ethiopia. National Crop Leads, Dr. Negash Geleta (wheat) and Tokuma Guta (sorghum), led the conversation. Crop breeders from EIAR Kulumsa and Melkassa research stations brought key perspectives on human and institutional capacity building needs. Meetings with EIAR Director General, Dr. Feto Esimo; Deputy Director General, Dr. Diriba Geleti; and Director of the Crop Research Directorate, Dr. Fekadu Gurmu set a tone for meaningful partnership between EIAR and CRCIL. Visits to EIAR lab facilities presented the opportunity to speak with nutrition and food safety scientists about possible collaboration to achieve CRCIL cross-cutting objectives. Outside of EIAR, the group toured the International Livestock Research Institute's (ILRI) Forage Genebank and Ethiopia's Bio and Emerging Technology Institute (BETin). Each tour and meeting helped CRCIL to better understand the strengths, needs, and opportunities for advancement of climate resilient cereals in Ethiopia.



Upper Left: EIAR and CRCIL Engine members.



Upper Right: Touring the BETin facility in Addis Ababa

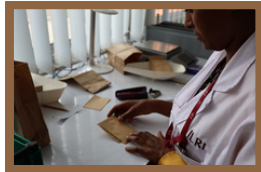
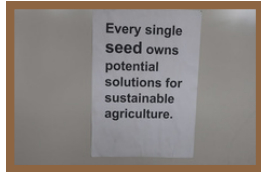


Photo on the Left: A sign on the wall reminds everyone of the importance of CRCIL work.

Photo on the Right: Preparing seeds for storage at ILRI Forage Genebank



Photo Above (left): Capacity building workshop with EIAR researchers



Photo Above (right): Touring EIAR nutrition laboratories

# Quick Win Research Update

Submitted by: Dr. Jared Crain, Kansas State University

CRCIL activities are picking up and gaining momentum across the entire portfolio. As part of research for development, several initial research activities were planned to obtain preliminary knowledge, fill capacity gaps, and address time-sensitive questions. While many important initial activities are in progress, like Louisiana State University (LSU) receiving tissue from the Bangladesh Rice Research Institute (BRR) to identify which known rice blast genes are in the BRR germplasm collection or the University of Florida's adaption of the maize crop growth model to sorghum, these concrete actions gloss over the ideals and aspirations of CRCIL.

When each initial activity was proposed, they were stand-alone projects. Since the inception of CRCIL, each Quick Win has been refined by a consortium of partners, forging connections between US universities and national partners. These partnerships have been formed through initial site visits and have capitalized on national partners' germplasm and knowledge and linked them to 21st-century plant breeding expertise. The collaboration between diverse groups has and will continue to result in more ambitious project goals, delivering enhanced germplasm and increased capacity for everyone involved. As CRCIL moves beyond initial activities, we believe the model of getting a consortium of US and national partners together and allowing scientific programming to evolve around strategic needs organically will ultimately lead to program success.

# CRCIL Website

The CRCIL website is now live at [www.ksu.edu/crcil](http://www.ksu.edu/crcil). The website will feature updates, reports, newsletters, and more. Make sure to click on the link so that you can receive the latest information and updates about CRCIL.

# LINKED IN

The Feed the Future Innovation Lab for Climate Resilient Cereals is on Linked In; scan the QR code below or click the link to follow the work in Bangladesh, Ethiopia, and Senegal. Share the posts, tag CRCIL in the work that you are doing, and engage in conversation surrounding climate resilient cereals.



[Click here to follow CRCIL on Linked In](#)



Scan here to follow CRCIL on Linked In

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