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

Feed the Future Innovation Lab for Climate Resilient Cereals

AUGUST 2024

In this edition:

This edition includes a spotlight on Dr. Ratna Rani Majumder (BRRI), highlights from the recent EAC meeting in Washington, DC, a highlight on an abiotic stressor, and an update on the Rice Quick Win.

Monthly Newsletter

Thank you for reading the Climate Resilient Cereals Innovation Lab Newsletter. Each month, we'll bring exciting updates from our consortium partners while spotlighting different cereals. We'll report our monthly successes, recap recent activities and research outputs, and give 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.

Dr. Ratna Rani Majumder

Dr. Ratna Rani Majumder is from Bangladesh, her village is situated in Bagerhat, which is near the coastal region of Bangaldesh

What is your roll at BRRI?

I am a senior scientist of BRRI designated as a senior scientific officer of the Plant Breeding Division of BRRI, Gazipur. I joined this division in 2009. Since then, I have been working as a co-investigator in the development of rice varieties in different ecosystems in Bangladesh. My research areas are rainfed lowland rice (RLR), drought tolerant rice (DTR), zinc enriched rice (ZER), premium quality rice (PQR) in the Boro season, golden rice, and high iron and zinc rice in Transplant Aman (T. Aman) and Boro seasons.

What do you see as one of the key challenges in the Climate Resilient Cereals space in Bangladesh?

The key challenge might be a lack of sufficient scientific knowledge for new innovative works. Even if any work has started after a certain period, it is stopped due to funds. There are also challenges in working with the research management systems to do research systematically.

Dr. Ratna Rani Majumder's displays some of the rice seed she has worked on at BRRI.

We admire you as a young female leader, what would you give as advice for others who aspire to leadership positions?

Working hard without the expectation of getting anything can bring success. A successful person is a leader. You need not prove yourself to be a leader; people will establish you as a leader. In recent days, eligible females have been recruited more than males for jobs without any privileges. Females can develop strong personalities to lead anything in the future.

Why is localization important?

In any adverse climatic condition, localization is important because genetic and environmental interactions affect them. One variety may not result in optimum output in one place, but it can give an outstanding result in another place. This is because of genetic variation, which is inherent in anything. Without any variations, no changes can occur to overcome the adverse situations. Changes are always seen when a stable condition is disturbed.

What are the opportunities that you see in Climate Resilient Cereals in Bangladesh?

I am working with drought tolerance in rice. I expect to reveal something new with CRCIL. Climate resilience with drought-tolerant rice can open the opportunity to generate new information and activities I can use in the research. This idea can be beneficial for Bangladesh in the long run. There might be opportunities for the scientists of BRRI to develop themselves in US Universities.

Drought: A Common Abiotic Stress

Drought, or water deficit, is surprisingly common in the world, with 6 out of 10 people in the world's population experiencing water stress each year. In the past 50 years, the number of drought events has increased, with a disproportionate (85%) of people affected by drought living in low to middle-income countries. Extreme drought can lower low and middle-income GDP by 0.85%, significantly challenging local development and the economy. Climate resilience and drought tolerance go hand in hand for CRCIL researchers as drought is only expected to increase in the future, with numerous projects in sorghum, millet, and rice aimed at developing more drought-resistant varieties.

Source: https://www.worldbank.org/en/news/immersive-story/2023/09/12/droughts-and-deficits-the-global-impacts

DID YOU KNOW?

- By 2030, 40% of the world's population, or as many as 700 million people, will be at risk of being displaced because of drought.*
- While drought directly causes food and water shortages, it also impacts the health and economies of countries and nations. Malnutrition, an increase in infectious diseases, mental health disorders, and a loss of jobs are just a few examples of the impact of drought in countries.*
- There are different types of droughts: meteorological (lack of precipitation), agricultural (lack of moisture in the soil where crops grow), hydrological (low levels of water in lakes and reservoirs), and socioeconomic (water shortages in drinking and running water).
- Droughts can be mitigated by conserving water, recycling wastewater, and practicing appropriate land management strategies.

*World Health Organization, Drought

EAC Meeting Highlight

CRCIL is fortunate to call on an External Advisory Committee (EAC) that provides a range and depth of expertise in crop science and international agricultural research for development. In cooperation with National Agricultural Research Institute (NARI) partners and with input from USAID, the Management Entity met with the EAC in July to debrief initial CRCIL activities and discuss research priorities for the coming years. One highlight of the meeting included NARI presentations about their climate resilience priorities and capacity strengthening needs, followed by a Q&A session, which facilitated rich discussions between the EAC and local partners. CRCIL is also grateful to USAID for the opportunity to meet with staff from the Bureau for Resilience, Environment, and Food Security (REFS) and across the agency.

EAC Members, CRCIL ME, and USAID staff met at USAID in Washington, DC.

Back Row: Jeff Ehlers (EAC), Jim Gaffney (USAID) , Jagger Harvey (CRCIL ME), Jared Crain (CRCIL ME), Bob Zeigler (EAC), Eric Danquah (EAC)
Middle Row: Hailu Wordofa (USAID), Ashish Saxena (USAID)
Front Row: Shoba Sivasankar (EAC), Reed Middleton (CRCIL ME), Fetien Abay-Abera (EAC)

Rice Quick Win Forges Ahead

Submitted by: Jared Crain, Assoc. Director CRCIL, Kansas State University

The rice quick win collaboration between the Bangladesh Rice Research Institutes (BRRI) and Louisiana State University (LSU) results in new knowledge and applications. In April, BRRI shipped LSU PI Adam Famoso and LSU CRCIL researcher Jomar Punzalan tissue from nearly 350 diverse rice germplasm. The LSU team has made quick work by genotyping the material for expected disease resistance based on markers that work within the LSU breeding program (Figure 1). Based on these findings, the Quick Win team is now evaluating how to incorporate this information into the breeding program at BRRI. This new genomic information will be augmented with phenotypic data currently collected by BRRI scientists. This will allow the team to determine if the LSU markers work in the BRRI germplasm or if further refinement is necessary. Additionally, the team is considering how best to develop a core collection that can scale to the BRRI breeding program to use this information to develop elite germplasm.

	RRS_Marker_ID	861b	714	716b	936	931b
	Chr.	2	2	2	6	6
	IRGSPV1	24386096	35100767	35101678	10352083	10363327
	NT Locus validated	CRSP2.1	Pib	Pib	Piz	Piz
	Trait validated	Cercospora	Blast	Blast	Blast	Blast
	X Allele FAM	C(Res)	A(Sus)	G(Sus)	C(Sus)	T(Sus)
	Y Allele HEX	T(Sus)	G(Res)	A(Res)	T(Res)	G(Res)
	Note					
Block	Well_ID	861	714	716	936	931
Block: 1	A1	Res:Res	Res:Res	Res:Res	Sus:Sus	Sus:Sus
Block: 1	B1	Res:Res	H/Y?	Res:Res	Sus:Sus	Sus:Sus
Block: 1	C1	Res:Res	Res:Res	Res:Res	Sus:Sus	Sus:Sus
Block: 1	D1	Res:Res	Sus:Sus	Sus:Sus	Sus:Sus	Sus:Sus
Block: 1	E1	Res:Res	Sus:Sus	Sus:Sus	Sus:Sus	Sus:Sus
Block: 1	F1	Res:Res	Sus:Sus	Sus:Sus	Sus:Sus	Sus:Sus
Block: 1	G1	Res:Res	Res:Res	Res:Res	Sus:Sus	Sus:Sus
Block: 1	H1	Res:Res	Sus:Sus	Sus:Sus	Sus:Sus	Sus:Sus
Block: 1	A2	Res:Res	Sus:Sus	Sus:Sus	Sus:Sus	Sus:Sus

Figure 1. Graphical overview of estimated Resistance (Res) or Susceptibility (Sus) to rice diseases at various marker loci.

Biscuits

Submitted by: Jared Crain, Associate Director CRCIL, Kansas State University

Ingredients

- 4 Cups Flour
- 5 tsp. Baking Powder
- 1 tsp. Baking Soda
- 1 TBLSPN Sugar
- 3/4 tsp. Salt
- 1/2 Cup Shortening
- 1 ½ Cups Buttermilk

Directions

- Preheat oven to 450 degrees Fahrenheit
- Combine flour, baking powder, baking soda, sugar and salt.
- Mix in shortening, forming coarse crumbs. This may be done in the food processor or wire pastry blender, then moved to a mixing bowl. The dry mixture with shortening can be stored and used later.
- Stir in buttermilk, place on a floured surface, knead 6 to 8 times until smooth.
- Roll to about ½ inch thick, cut, and place on a baking sheet.
- Bake 12 to 15 minutes at 450 degrees.
- Tops may be brushed with melted butter before baking.

Biscuits pictures above were made with SUNU BLÉ flour from Senegal.

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