Summary Research Program 2023-2024

Program Area: Crop-Soil-Water Management

Program performing unit: **Agronomy Division**

Sl. No.	Title	Objective (s)	PI/CI	Status	Remarks
1	**Seed and Seedlings**				
1.1	Effect of Nanoparticles to reduce Chilling Stress in Rice	To mitigate chilling stress of rice seedling by nano Zno	S A Islam, R Shultana, M M Mahbub, A Sultana and M K A Bhuiyan	On going	
2	Planting Practices				
2.1	Effect of time of planting on the yield of submergence tolerance PVT genotype	To determine optimum planting time of the submergence tolerance PVT genotype (IR16F1148) for higher yield levels in T. Aman season	MM Rana, MZI Baki	On going	
2.2	Yield Loss Assessment of Rice under Late Planting Condition	1. To quantify the effect of planting date on the key agronomic traits of BRRI dhan88 and BRRI dhan89 2. To identify an optimal planting window to maximize grain yield of BRRI dhan88 and BRRI dhan89 3. To determine the average loss when BRRI dhan88 and BRRI dhan89 are planted outside the optimal window	M M Rana, Rakiba Shultana, Belal Hossain Amena Sultana, M Sh Islam	On going	
3	**Fertilizer Management**				
3.1	Effect of combined application of fertilizer and plant protectants on Water logging T. Aman rice	To determine the effect of combined application of fertilizer and plant protectants on the growth, yield and nutrient uptake of water logging T. Aman rice	Nasima Akter	On going	
3.2	Growth stage based Agronomic management for yield maximization of Hybrid rice	1.To investigate hybrid rice response to different nitrogen levels and timing of application at different growth stage to achieve higher yield and 2. To determine nitrogen, use efficiency of BRRI hybrid rice varieties	M K A Bhuiyan; M M Mahbub, S A Islam, ZI Baki and M Sh Islam	On going	

3.3	Effect of N levels and growth stage based N application on growth, yield and nitrogen use efficiency in Rice	To find out the influence of growth stage-based nitrogen application on growth and yield of rice	M M Mahbub, M K A Bhuiyan; S A Islam and M Sh Islam	On going	
3.4	Effect of BRRI Bio-organic fertilizer on growth and yield of BRRI dhan90	To find out the benefit of BRRI biofertilizer with inorganic fertilizer for BRRI dhan90	A Sultana, R Akhter, U A Naher and R Sultana	On going	
3.5	Effect of organic and inorganic source of nutrients on nitrogen mineralization, microbial population and yield of rice	1.To determine the mineral nitrogen content under different nutrient management in soil 2.To investigate the effect of integrated nutrient management on soil microbial population 3.To find out the best organic material management practice to improve soil health and rice yield	R Akter	On going	
3.6	Application of chitosan to improve salt tolerance of rice	To elucidate the chitosan's response on growth, chlorophyll content, proline content, photosynthetic activity, K^+/Na^+ ratio and yield of salt-sensitive and salt-tolerant rice cultivars under salinity stress.	N Akter	On going	
4	**Weed Management**				
4.1	Effect of herbicide on Azolla infestation in rice field	To reduce the abundance of Azolla from rice fields	MM Mahbub, MKA Bhuiyan, MM Rana, SA Islam, One Scientist from BRRI R/S Rangpur	On going	
4.2	Residue analysis of herbicide, insecticide and fungicide in soil, water and rice under irrigated ecosystem	To analyze the MRL of pesticide in water, soil and rice	N Akter, M N Bari, M K A Bhuiyan, M A I Khan, H B Sazib, S A Islam and M Sh Islam	On going	
4.3	Changes in the Weed Seed Bank in long-term fellow management and herbicide uses in Rice- rice Cropping System	1.To assess the total number of weed seeds reserve, species composition and dominant weed species present in rice field and 2.To reduce weed seed reservoir through fellow management in different soil depth	M K A Bhuiyan	On going	

4.5	Residue analysis of widely used herbicides in the irrigated rice ecosystem by LCMS-MS	To determine the residue of pre and post-emergence herbicides in the irrigation water, soil, rice straw and grain	M SA Islam		
5	**Yield Maximization**				
5.1	Effect of agronomic factors for maximizing yield of BRRI dhan70 through developing sustainable production management protocol	1.To study contributions of agronomic factors to maximize yield of BRRI dhan70 2.To find out the best production management protocol for higher yield of BRRI dhan70	Dr. Md Abu Bakar Siddique Sarker	On going	
5.2	Maximizing yield of BRRI developed new varieties through influencing some Agronomic Critical Factors	1.To study the effect of most critical Agronomic factors for yield maximization of T Aman varieties 2.To find out and recommend the most appropriate Agronomic critical factors packages for yield maximization of BRRI developed long, medium and short duration T Aman varieties.	Dr. Md Abu Bakar Siddique Sarker	On going	
5.3	Effect of agronomic factors for maximizing yield of BRRI dhan94 through developing sustainable production management protocol	To find out the best production management protocol for sustainable higher yield of BRRI dhan94	Dr. Md Abu Bakar Siddique Sarker	On going	
5.4	Maximizing yield of BRRI developed new varieties through influencing Agronomic Critical Factors	To find out and recommended the most appropriate Agronomic critical factors packages for yield maximization of Boro varieties.	Dr. Md Abu Bakar Siddique Sarker	On going	
5.5	Effect of some agronomic factors for maximizing yield of BRRI dhan92 through developing sustainable production management protocol	To find out the best production management protocol for sustainable higher yield of the long duration variety	Dr. Md Abu Bakar Siddique Sarker	On going	
6	**Good Agricultural Practices**				
6.1	Yield maximization of Boro rice through good agricultural practice	To observe growth and yield of Boro rice and to reduce production cost by minimum use of inputs (fertilizer, pesticide, water).	MKA Bhuiyan, M Shahidul Islam, Shah Asadul Islam, MM Mahbob ,Rumana Akter	On going	
7	**Soil Health Improvement**				

7.1	Improvement of soil health in four crops pattern through agronomic management	1. To improve the soil health 2. To increase the cropping intensity and productivity	M Sh Islam	On going	
7.2	Biodegradation of pesticides in soil using selected microbial strains	To estimate the rate of pesticides degradation by the soil microbes	Rakiba Shultana	On going	
7.3	Screening of salt-tolerant PGPR isolated from coastal saline soil in Bangladesh	To characterize the bacterial strains for salt-tolerance and plant growth-promotion	Rakiba Shultana	On going	
7.4	Effect of ST-PGPR inoculation on seedling growth of rice under saline condition, Boro 2022	To observe the effect of ST-PGPR inoculation on plant salinity tolerance	Rakiba Shultana	On going	
7.5	Molecular characterization of Arbuscular Mycorrhizal fungal community composition associated with different stages of hilly rice in Bangladesh	1. To characterize the potential AMF communities associated with different hilly rice ecosystem in Bangladesh 2. To investigate their relationship with environmental factors 3. To isolate indigenous AMF stain from hilly rice roots and soils 4. To promote rice growth by using the isolates	Dr. Md. Zakaria Ibne Baki	On going	
8	**Molecular Trait Management**				
8.1	Evaluation of agronomic and bio-molecular traits of BRRI released drought tolerant rice	1. To identify enzymatic activities in drought stress of rice. 2. To identify drought tolerant mechanism of BRRI released variety for enhancing agronomic productivity	S A Islam, M M Rana, R Shultana, N Akther, M M Mahbub, R Akther	On going	
8.2	Physiological, biochemical and molecular mechanisms of salinity tolerance in rice	To get insight into the physiological, biochemical and molecular mechanisms by which BRRI developed salt-tolerant varieties respond to the salinity stress	M M Rana, S A Islam, R Shultana, M S Rahman	On going	

Research Program 2023-2024

Sl. No.	Title	Objective (s)	PI/CI	Status	Remarks
2	**Planting Practices**				
2.1	Effect of time of planting of newly developed BRRI varieties in different regional stations	1. To find out the suitable time of planting of different popular varieties in different R/S 2. To find out the cut of transplanting dates for different varieties 3. Yield loss assessment due to delay planting	Program leader: Head, Agronomy Division All Agronomists working at R/S will be the PI (Monitoring team will monitor)	New	
3	**Fertilizer Management**				
3.1	Yield loss assessment due to omission of N at certain growth stage of rice	To assess yield loss of rice due to improper N application	M M Mahbub, R Shultana, R Akter, M K A Bhuiyan	New	
3.2	Performance evaluation of Zeba coated urea (ZCU) on nutrient uptake, nitrogen use efficiency and grain yield of transplanted rice	To evaluation the effect of Zeba coated urea (ZCU) on nutrient uptake, nitrogen use efficiency and grain yield of transplanted rice	MKA Bhuiyan, M Mahbub, R shultana, and Sh Islam	New	
4	**Weed Management**				
4.1	Effect of adding urea with herbicides for controlling weeds and the growth and yield of transplanted rice	To find out the effect of urea mixing with commonly used herbicides on weed control efficiency and the growth and yield of transplanted rice	MKA Bhuiyan, M Mahbub and J Ibne Baki	New	
5	**Yield Maximization**				
5.1	Effect of agronomic factors-based managements on lodging behavior of BRRI varieties	1. To study the effect of agronomic factors-based managements on varietal lodging behavior 2. To recommend the judicial management protocol for sustainable yield of different varieties	Md Abu Bakar Siddique Sarker, R Akter, N Akter	New	
6	**Soil Health Improvement**				
6.1	Changes in soil microbial community and activity caused by application of	1.To evaluate the changes in the microbial community (genus & species level) and activity	Dr. Md Zakaria Ibne Baki	New	

	Bispyribac Sodium and Bensullfuran methyl + acetaclor	after the application of Bispyribac Sodium and Bensullfuran methyl + acetaclor 2.To investigate the microbial population shifting during the rice growth period 3.To find out their relationship with environmental factors	CI: Dr. Khairul Alam Bhuiyan, Shah Ashadul Islam, Mostofa Mahbub		
6.2	Effect of herbicides on soil microbial community, soil fertility and enzyme activity	1.To characterize the herbicide-induced responses of microorganisms in transplanted rice 2.To examine the influence of herbicides on soil fertility and enzyme activity of soil microbes	Amena Sultana, R Akter, N Akter, MKA Bhuiyan, U A Naher	New	
6.3	Mitigation of Heavy Metals Bio-accumulation in Rice Varieties through Agronomic Management at polluted Soils of Gazipur	1.To determine the heavy metal concentrations, growth and yield of rice grown in the contaminated soil of Gazipur. 2.To assess the effects of amendment's on reducing heavy metals (As, Pb, Cd, Cr, Co, Hg), and nutrient uptake of rice grown on heavy metal contaminated soil.	N Akter, M Akter (Soil Sci.), PC Pal (IWM), HB Shozib (GQN), SA Islam, A. Sultana, R. Akter and MSh Islam	New	
7	**Precision Agriculture**				
7.1	Precision Agriculture management techniques for sustainable rice production	1. To improve rice yield and grain quality, reducing input costs and environmental impact, and increasing efficiency and sustainability of the production process. 2. To make precise and accurate agronomic decisions at the field level 3. To develop and optimize precision agriculture practices and tools that are specific to rice production systems and are adaptable to local conditions and agro-climatic variations. 4. The overall objective is to improve the competitiveness of rice production, while ensuring the sustainability of the agricultural ecosystem	Dr. Md Zakaria Ibne Baki CI: Dr. Khairul Alam Bhuiyan, Niaz Md Farhat Rahman	New	