Proposed Research Program 2024-2025

	Agronomy Division			
Sl. No.	**Program Area/Project/ Experiment Title & Duration**	**Major Objective**	**Expected output**	
	Fertilizer Management			
1	Identification of BRRI developed boro rice varieties efficient to nitrogen fertilizer (2 Yrs)	1. To find out potential nitrogen efficient rice varieties. 2. To identify physiological characters and molecular mechanisms responsible for NUE. 3. To evaluate the agronomic performance of high NUE rice varieties under reduced nitrogen conditions.	Potential nitrogen efficient rice varieties will be identified	400
2	Nitrogen Fertilizer Optimization and Its Response to the Growth, Yield, and Quality of Premium Quality Boro varieties (2 Yrs)	1. Determine the optimum nitrogen fertilizer rate for premium quality Boro varieties to maximize yield without compromising quality. 2. Evaluate the response of Boro varieties to different nitrogen fertilizer rates in terms of growth parameters such as plant height, leaf area index, and biomass accumulation. 3. Assess the impact of nitrogen fertilizer optimization on grain yield, and grain quality attributes (e.g., grain size, protein content, and milling quality and 2AP) 4. Investigate the nitrogen use	To maximize yield The optimum nitrogen fertilizer rate for premium quality Boro varieties will be explored.	200

		efficiency (NUE) of premium quality Boro varieties under varying nitrogen fertilizer regimes.		
3	Fertilizer management for sustainable crop production in the T. Aman-Mustard-Boro-cropping pattern (2 Yrs)	1. To assess the soil nutrients status in T. Aman and Boro season 2. To assess the changes in soil nutrient contents with different fertilizer management 3. To find out the appropriate fertilizer management and specific variety for yield maximization of rice. 4. To find out the appropriate fertilizer management and specific variety for yield maximization of mustard		500
	Stress Management			
4	Heat stress alleviation in rice at the anthesis through agronomic practices (2 Yrs)	1. To elucidate the response of phenology, growth, yield and grain quality of rice to heat stress during the anthesis. 2. To determine the effect of management practices to resist heat stress in rice	Yield loss due to heat stress will be quantified and possible heat stress mitigation technique will be developed.	300
5	Coactive role of Zinc oxide nanoparticles and stress-tolerant PGPR on drought stress in rice (2 Yrs)	1. To evaluate the individual effects of nano ZnO and PGPR on plant growth and physiological responses under drought stress conditions. 2. To assess the combined effects of co-inoculation of nano ZnO and PGPR on plant growth, water use efficiency, and stress tolerance. 3. To investigate the underlying	The individual effects of nano ZnO and PGPR on plant growth and physiological responses under drought stress conditions will be explored.	300

		mechanisms involved in drought stress mitigation by nano ZnO and PGPR, both individually and in combination.		
	Yield Maximization			
6	Effect of agronomic critical factors-based managements for different yield goal level on lodging behavior of T Aus variety at Middle and Northern parts of Bangladesh (2 Yrs)	1. To study the effect of agronomic factors-based managements on varietal lodging behavior at different yield goal level of T Aus. 2. To recommend the judicial management protocol for sustainable yield of different variety in T Aus season.	The judicial management protocol for sustainable yield of different Aus variety will be developed	400
7	Knockout of *Gn1a* and *DEP1* CRISPR/Cas9 for Yield Maximization (5 Yrs)	1. To knockout *Gn1a and WFP/IPA1 or DEP1* gene by CRISPR Cas9 genome edition technique. 2. Evaluation of the effects of the target alleles in popular rice background through phenotypically and molecular basis	To improve rice yield through modifying yield-determining traits of existing cultivars using a molecular approach to ensure food security in the era of climate change.	700
	Weed Management			
8	Herbicide Resistance Screening in Mixed Weed Flora against Popular Herbicide: Insights from Field and Laboratory Studies in Bangladesh (2 Yrs)	1. Identify herbicide-resistant weed species present in mixed weed flora 2. Determine the level of resistance and the mechanisms involved (e.g., target-site mutations, metabolic resistance). 3. Evaluate the effectiveness of popular herbicides against resistant weed populations. 4. Provide recommendations for	The level of resistance and the mechanisms involved (e.g., target-site mutations, metabolic resistance) will be dtermined	300

		integrated weed management strategies to combat herbicide resistance.		
9	A Field survey on weed diversity in different Agricultural regions of Bangladesh	1. To know the weed management option and to formulate recommendation of standard herbicides with appropriate doses in different ecosystem. 2. To formulate a weed database with major or minor weeds in rice ecosystem. 3. To investigate the distribution and severity of weed flora prevailing in different agricultural rejoins 4. Identify emerging weed problems and directions for further research and development for improved weed management in upland and lowland rice.	• The distribution and nature of major and minor weeds of upland and lowland rice have been idenfied due to changing climate and cropping pattern. • Will be idenfied weed database that will help to formulate appropriate weed management action	500
10	Assessment of yield and economic losses in rice due to weeds in Bangladesh	1. To find out the actual yield loss in farmers level of Bangladesh due to improper weeding. 2. To findout the potential yield loss in different locations of Bangladesh.	Actual and potential yield loss (%) by weeds in the farmer's field will be fild out which will make weed management decision better.	500