

**Bangladesh Rice Research Institute  
Regional Station, Cumilla  
Research Program Outline 2021-22**

**Program Area: Regional Station Program Area (RSPA)**

SN	Experiments	Specific Objective(s)	Materials & Method	PI and CI	Status (initiation) /Season	Location
<b>Program Area (01): Varietal Development Program (VDP) Program for T. Aman season 2021-22</b>						
1.	<b>Project-1: Development of Transplanted Aman Rice with high yield along with desirable growth duration, acceptable grain quality and resistance to diseases and insect pests, water stagnation tolerant and premium quality rice (BRRI R/S, Cumilla own program) Project leaders: AKM Shalahuddin, I Zahan, KM Iftekharuddaula and A Islam</b>					
1.1	Hybridization	Introgression of genes from diverged genetic background into rice varieties/lines for the improvement of standard T. Aman varieties	17 parents will be used	PI: AKMS CI: IZ, KMI, AI	Ongoing T. Aman	BRRI R/S, Cumilla
1.2	Confirmation of F <sub>1</sub>	To confirm the crosses as true hybrid	22 F <sub>1</sub> -s will be grown	Do	Ongoing T. Aman	Do
1.3	Growing of F <sub>2</sub> population	Selection of progenies with emphasis on earliness, plant type, grain type and high yield potential compared to standard check varieties	26 F <sub>2</sub> will be grown	Do	Ongoing T. Aman	Do
1.4	Pedigree nursery	Selection of progenies with improved plant type, earliness, acceptable grain quality and high yield potential compared to standard varieties	930 segregating materials from 94 crosses will be grown	Do	Ongoing T. Aman	Do
1.5	Observational Yield Trial (OYT)	Initial yield evaluation of advanced lines compared to standard checks	28 test entries along with 6 checks will be evaluated Cks: BRRI dhan34, BRRI dhan39, BRRI dhan52, BRRI dhan57, BRRI dhan75 and BRRI dhan87	Do	Ongoing T. Aman	Do
1.6	Preliminary Yield Trial (PYT)	Preliminary yield evaluation of advanced lines compared to standard checks	8 test entries along with 4 checks will be evaluated, Cks: BR22, BRRI dhan49, BRRI dhan75 and BRRI dhan87	Do	Ongoing T. Aman	Do
1.7	Advanced Yield Trial-1 (AYT-1)	Evaluation of advanced breeding lines compared to standard checks	7 test entries along with 02 checks will be evaluated Cks: BRRI dhan75 and BRRI dhan87	Do	Ongoing T. Aman	Do
1.8	Advanced Yield Trial-2 (AYT-2)	Evaluation of advanced breeding lines compared to standard checks	06 test entries along with 02 checks will be evaluated Cks: BRRI dhan49 and BRRI dhan87	Do	Ongoing T. Aman	Do
1.9	Advanced Yield Trial-3 (AYT-3) (Water Stagnation)	Evaluation of advanced breeding lines compared to standard checks	04 test entries along with 03 cks will be evaluated Cks: BRRI dhan76, BRRI dhan77 and BRRI dhan79	Do	Ongoing T. Aman	BRRI Cumilla, Gazipur
1.10	Maintenance breeding	Conservation of advanced lines and pre-breeding materials	Around 100 advanced lines and local germplasm will be grown	Do	Ongoing T. Aman	BRRI Cumilla

**Expected Output:** Desirable growth duration compared to standard check varieties along with >6.0 t/ha yield potential and premium quality and >5.50 t/ha yield potential with premium quality and water stagnant lines will be developed

## 2. Program Area: Pest Management

SN	Experiments	Specific Objective(s)	Materials & Method	PI and CI	Status (initiation) /Season	Location
2.1	Survey and yield loss assessment of rice blast disease in Cumilla district	1. To know the prevalence of Major rice disease blast 2. To assume the rice yield losses due to rice diseases	Surveyed Area: 3 Upazilla of Cumilla district Yield loss estimation: Using severity scale in one selected block of Nangalkot upazila	PI: MMR, MH; CI: MAIK, AI MAL, THA	Ongoing Year round	BRRRI Cumilla
2.2	Validation of rice neck blast disease management technology under farmer's field condition	1. To minimize yield loss due to blast disease 2. To build up farmers awareness on blast disease management	About 5 farmers and BRRRI Cumilla farm (30 decimal for each farmer) will be selected. BRRRI practices: 1. 5 kg MOP/33 decimal will be additionally applied at last urea top dress 2. Trooper/Nativo will be sprayed at late booting and flowering stage Farmers Practice: Farmers own practice	PI: MMR CI: MH, RS, TF, BS, AI	2018 (on-going) T. Aman, Boro	BRRRI Cumilla
2.3	Varietal reaction and recovering ability of BRRRI released rice varieties	To know the varietal reaction against tungro disease of rice	Natural infection of rice tungro disease on BRRRI released rice varieties and their recovering ability against this disease	PI: MMR CI: MH, SAIN, MSM, RS, TF, BS, AI	2018 (On-going) Aus, Aman, Boro	BRRRI Cumilla
2.4	Factors affecting rice tungro disease and validation of the management technology in Cumilla region	To find out the factors and validate the management technology of rice tungro disease in Cumilla region	Weather data: Temperature, Rainfall & Humidity Data collection: GLH population 5 days interval by Light Trap and hand sweeping, % DI & DS of Tungro disease Cropping Pattern: Rice-Rice-Rice/Fallow-Rice-Rice/Fallow-Fallow-Rice, Rice-Rice-Fallow Training: All SAAOs and farmer groups Location: Tungro prone areas of NangalKot, Laksam, Chandina, Debidwar in Cumilla; Kasba in B Baria Budget: 1000 Lac PI: MM Rashid CI: MS Mia, M Hossain, SAI Nihad, TH Ansari, MA Latif Control of green leaf hopper: Seedbed along with surroundings should be free from GLH light trapping/hand sweeping/insecticide spray. Spray registered systemic insecticides: MIPC 2.6g or Cartap 2.4g Schedule of spray in the seedbed: =Spray should be done 2 times for controlling GLH. =The season-wise spray times are as follows: a) In Aus season: 10 DAS and 3-5 DBT b) In T. Aman season: 10-15 DAS and about 5 DBT c) In Boro season: 15-20 DAS and about 5 DBT Uprooting the tungro infected plants (if visible in the main field) <b>Tungro infected seedlings/seedbed must not use for transplanting</b> Farmer Practice: T4= Control (No spray)	PI: MMR CI: MSM, MH, SAIN, MAIK, MAL, RS, BS, TF, AI	2021 (New) Aus, Aman & Boro Year: 2021-2025 (1 <sup>st</sup> phase)	Cumilla, B Baria
2.5	Tracking the infection source(s) of rice false smut disease	To identify whether the seed/soil and/ or the air is/are the carrier of the pathogen or not	<b>Methodology:</b> <b>Variety:</b> BRRRI dhan49 <b>Seeding Time:</b> 4 (25 Jun, 10 Jul, 25 Jul, 10 Aug) <b>Planting time:</b> 4 (20 July, 5 Aug, 20 Aug, 5 Sep) <b>Expt. type:</b> Pot (nethouse and field) (3 hill/pot) and Field (5 lines and 10 hill/treatment) <b>Treatments:</b> T1 = Seedlings will be Transplanted from	PI: MMR CI: BN, MH, MAIK, MAL, AI	2019 (On-going) T. Aman 2020	Cumilla

SN	Experiments	Specific Objective(s)	Materials & Method	PI and CI	Status (initiation) /Season	Location
			infected seeds with sterilized soil; T2 = Seedlings will be Transplanted from treated healthy seeds with sterilized soil; T3 = Seedlings will be Transplanted from treated healthy seeds with infected soil; T4 = Seedlings will be Transplanted from infected seeds with infected soil; T5= Seedlings will be Transplanted from infected seeds with infected stubbles <b>Replication:</b> 3 (pot expt.); <b>Sterilized Soil:</b> Soil will be collected from 4 ft depth unused soil			
2.6	Effectiveness of formulated biopesticides to control bakanae disease of rice in field condition	To evaluate field efficacy of formulated biopesticides against bakanae disease of rice	Location: Debidwar 2 sites Treatments: T1=Trichoderma treated from seedbed T2=Trichoderma+Bacteria 1 T3= No treatment % DI and DS of Bakanae disease will be recorded in the vegetative stage at 30 days interval.	PI: MH, QSAJ CI: MMR, MAL, AI	2021 (New) Boro 2020-21, Aus & Aman2021	Cumilla
2.7	Evaluation of new chemicals against Blast, Sheath blight diseases of rice	To find out the effective chemicals suitable for Blast, ShB diseases of rice.	Location: BRRRI Cumilla Farm Selected fungicides from Chemical companies will be tested following SES, 2013 method	PI: MH, MMR CI: MA, AA, MAIK, THA, MAL, AI	2020 (On-going) Aman, Boro	Cumilla
2.8	Advisory services to the farmers	1. To assist farmers for rice production;	Location: Cumilla, Chadpur, B. Baria Ways: Mobile services, Website, email, direct field visit, on station farmers' samples; Fund: GOB	PI: MH CI: MMR, FHK, AKMS, BS, TF, RS, AI	Ongoing Year round	Cumilla, Chadpur & B. Baria

**Expected Output:** Management of major rice disease will be developed for increasing rice production and ensure food security

### 3. Crop-Soil-Water management

SN	Experiments	Specific Objective(s)	Materials & Method	PI and CI	Status (initiation) /Season	Location
<b>3.1 Agronomy</b>						
3.1.1	Effect of polythene covering on seedling raising in boro season	To identify the suitable techniques for protecting rice seedlings from cold injury	<b>Treatment:</b> i. Polythene covering for all time at seedbed ii. Polythene covering for 24 hours at seedbed during cold wave (little or no sunshine, foggy weather all day long, average temperature less than 15° C) iii. Polythene covering from 11.0 am to sun set iv. Polythene covering for whole night v. Polythene covering for all time with round shape opening (20 cm diameter) at both end of the seedbed cover vi. No polythene covering/ control	PI: RS, CI: MMR, TF, MMR, AI	On going 2020-2021  Boro	BRRRI Cumilla
3.1.2	Study on biodegradation of soil-applied pesticides in soil using selected microbial strain	1. To investigate the effect of pesticides on bacterial survivability in soil 2. To investigate the role of	<b>Factor A: PGPR strains</b> A) <i>Bacillus sp.</i> B) <i>Pseudomonas sp.</i> C) <i>Azospirillum sp.</i>	PI: RS, CI: AN, PA, RA. AI, SI	New 2021-2022  Boro	Agronomy division, BRRRI Gazipur

		bacteria on degradation of soil applied pesticides.	<b>Factor B: Group of herbicides</b> 1. Pretilachlor 2. Bensulfuron-methyl 3. Pyrazosulfuron-ethyl 4. Pendimethalin <b>Experimental design:</b> CRD with 3 replications			
3.1.3	Study on physico-chemical properties and microbial population in soil of different rice growing areas of Cumilla region	1. To determine the physico-chemical properties of soil. 2. To determine the microbial population in soil	<b>Treatment:</b> Soil will be collected from farmers field of three Upazillas 1. Sadar dokkhin 2. Adorsho Sadar 3. Barura Each farmers field will be considered as replication <b>Experimental design:</b> RCBD with 3 replications	<b>PI:</b> RS, <b>CI:</b> AN, MMR, NA, AI, SI	New 2021 T. Aman,	BRRRI, Cumilla & Agronomy division, BRRRI Gazipur
3.1.4	Influence of planting spacing and seedling age on dry matter partitioning of rice in boro season	1. To observe the effect of planting spacing on dry matter partitioning of BRRRI dhan96 2. To observe the effect of seedling age on dry matter partitioning of BRRRI dhan96	<b>Factor A: Spacing (cm)</b> 1. 15 x 20 (33.3 hills/m <sup>2</sup> ) 2. 2. 20 x 20 (25 hills/m <sup>2</sup> ) 3. 3. 20 x 25 (20 hills/m <sup>2</sup> ) 4. 3. 25 x 25 (16 hills/m <sup>2</sup> ) 5. 4. 25 x 30 (13.3 hills/m <sup>2</sup> ) <b>Factor B: Seedling age</b> 1. 30 days 2. 40 days 3. 50 days 4. 60 days <b>Design:</b> RCBD with 3 replications	<b>PI:</b> RS, <b>CI:</b> TF, AB, AI	New 2021-2022 Boro	BRRRI R/S, Cumilla
3.1.5	Effect of time of planting on growth and yield of BRRRI developed newly T. Aman and Boro varieties (new)	To find out the appropriate time of planting for yield optimization	Seeding dates: 15 Jun, 30 Jun, 15 Jul, 30 Jul, 15 Aug, 30 Aug and 15 Sep Seedling age: 30 days old seedling, Varieties: BRRRI released new Varieties, BRRRI dhan49 (ck.), Design: Split plot (planting date in main plot and varieties in sub plot) with three replications.	<b>PI:</b> TF <b>CI:</b> RS, BS, FHK, MH	Ongoing T. Aman, Boro	BRRRI Cumilla
3.2. Soil Science						
3.2.1	Effect of Potassium Fertilizer Management at Different Growth Stages of Rice	To find out the effect of potassium rate on different growth stages and to find out optimum rate of potassium to maximise yield.	<b>Treatment:</b> T1 = K0 (No Potassium), T2 = K Basal(RD) (80kg K/ha at basal ), T3 = T2+K2015 DAT(20kg k/ha at TS), T4 = T2+ K2015 DAT +K2030 DAT at MTS, T5 = T2+ K2015 DAT +K2030DAT +K2050 DAT at PIS , T6 = T2 +MTS +PIS, T7 = T2 +MTS Varieties: BRRRI dhan87(T.Aman), BRRRI dhan89(Boro) Design: RCBD with 3 rep. spacing: 20 cm x 20 cm	Do	New T. Aman ,Boro	BRRRI Cumilla
3.2.2	Long-term missing element trials for diagnosing the limiting nutrient in soil in BRRRI R/S Cumilla	1. To determine nutrient deficiency problems in soil through missing elements techniques. 2. To observe long-term yield trend of rice under different nutrients	NPkSZn, -N, -P, -K, -S and -Zn	<b>PI:</b> FHK <b>CI:</b> BS,TF,MM, MH	Ongoing T. Aman Boro	BRRRI Cumilla

		managements 3. To evaluate the changes in soil physical, chemical and biological properties under long-term fertilization				
3.2.3	Influence of nitrogen and potassium rates on performance of modern rice	To find out suitable ratio of N and K for MV rice cultivation and to study N and K dynamics in soil and plant	Treatments: T Aman2021: N0, N50, N75,N100: K0, K50,K75,K100,K150,K200 Boro2020-21: N0,N100,N120,N140; K0, K50,K75,K100,K150,K200	Do	Ongoing T. Aman Boro	BRRICumilla
3.2.4	Effects of N rates on the yield of BRRIRelated new varieties/ advanced lines in BRRIFarm Cumilla	1. To update the N rates of BRRIRelated new varieties/ advanced lines in BRRIFarm Cumilla	T Aman2021: N0,N25,N50,N75,N100,N125,N125,N175, N200; Boro2020-21: K0,K25,K50,K75,K100,K125,K175,K200	Do	New T. Aman Boro	BRRICumilla
3.2.5	Effects of P rates on the yield of BRRIRelated new varieties/ advanced lines in BRRIFarm Cumilla	1. To update the P rates of BRRIRelated new varieties/ advanced lines in BRRIFarm Cumilla	T Aman2021: P0,P10,P20,P30,P40,P50 Boro2020-21: P0,P10,P20,P30,P40,P50	Do	New T. Aman Boro	BRRICumilla
3.2.6	Effects of K rates on the yield of BRRIRelated new varieties/ advanced lines in BRRIFarm Cumilla	1. To update the N rates of BRRIRelated new varieties/ advanced lines in BRRIFarm Cumilla	T Aman2021: K0,K25,K50,K75,K100, K125 Boro2020-21: K0,K25,K50,K75,K100,K125,K175,K200	Do	New T. Aman Boro	BRRICumilla
3.2.7	Efficiency of DAP fertilizer for the supplementation of nitrogen	To evaluate the efficacy of DAP fertilizer on reducing N fertilizer	T1 = DAP, T2 = DAP+Urea appli 100%; 15+30 +45 DAT), T3 = TSP +Urea appli 100%; 15+30 +45 DAT), T4 = DAP + Urea appli100%; 30+45 DAT, T5= DAP + Urea appli 80%; 15+30+45 DAT), T6 = DAP + Urea appli80%; 30+45 DAT,T7 = DAP + Urea appli 60%; 15+30+45 DAT, T8 = DAP + Urea appli 60%; 30+45 DAT Variety: BRRIdhan87(T. Aman) and BRRIdhan96 (Boro)	PI: BS CI: FHK,TF, MMR, AI	Ongoing 2020 T. Aman Boro20-21	BRRICumilla
3.2.8	Regional Yield Maximization Trial (RYMT) under recommended management practices	1. To validate integrated improved management practices compared with BRRIRecommended practices. 2. To maximize proper filling of grains in a panicle under integrated management practices and by harvesting crop at 90% maturity (no shattering)	*IIMP (Integrated improved management practices) -60gms seeds/ m2 seed bed. -urea using 4 splits- basal, 25-30 DAT, 55-60 DAT and 75-80 DAT -Harvesting at 90% maturity. *Control (BRRIRecommended practices) -100gms seeds/ m2 seed bed. -urea using 3 splits- 10 DAT, 30-35 DAT and 55-60 DAT -Harvesting at 80% maturity.	Do	Ongoing Boro, 2020-21	BRRICumilla
3.2.9	Determination of appropriate time of DAP application to control Algal growth	1.To find out the appropriate time of DAP application 2.To control the algal growth in the rice field.	Treatments: T1 = DAP at 0 DAT (Basal); T2 = DAP at 10 DAT; T3 = DAP at 20 DAT; T4= DAP at 30 DAT; T5 = DAP at 40 DAT; Variety: BRRIdhan87(T Aman) and BRRIdhan92 (Boro) Design: RCBD Replication: Three (03)	Do	New 2021 T. Aman Boro21-22	BRRICumilla

**Expected output:** Healthy seedling raising techniques will be identified under cold stress conditions; The role of soil microbes on degradation of soil applied herbicides will be determined; The Response of BRRIdhan96 at various planting spacing and seedling age could be explored; Appropriate fertilizer rate and time of planting on new rice varieties will be determined; Suitability of Lowland rice in stagnant condition will be developed

#### 4. Socio Economic and Policy

SN	Experiments	Specific Objective(s)	Materials & Method	PI and CI	Status (initiation) /Season	Location
4.1	Stability analysis of BRRRI released rice varieties	To demonstrate the suitability of BRRRI varieties in greater Cumilla region	All Aus, T. Aman and Boro inbred and hybrid varieties	PI: FHK CI: TF, BS, RS, AKMS, MMR, MH, AI	Ongoing Year round	BRRRI Cumilla farm

**Expected Output:** Stability and suitability of BRRRI released rice varieties will be determined in greater Cumilla region

#### 5. Technology Transfer

SN	Experiments	Specific Objective(s)	Materials & Method	PI and CI	Status (initiation) /Season	Location
5.1	Multilocation trial of different BRRRI varieties in major cropping patterns	To demonstrate and disseminate BRRRI varieties in greater Cumilla region	Aus: BRRRI dhan82, BRRRI dhan85. T. Aman: BRRRI dhan75, BRRRI dhan87, BRRRI dhan93, BRRRI dhan94, BRRRI dhan95. Boro: BRRRI dhan74, BRRRI dhan81, BRRRI dhan84, BRRRI dhan86, BRRRI dhan88, BRRRI dhan89, BRRRI dhan92, BRRRI dhan96, BRRRI dhan100	PI: FHK CI: TF, BS, AKMS, RS, MMR, MH, AI	Ongoing Year round	Cumilla, B. Baria, Chandpur
5.2	Farmer's and SAAOs training on modern rice cultivation and disease management technology	To increase farmers knowledge	100 Farmers training: About 3000 farmers 33 SAAO Training: 600	Do	Ongoing Year round	Cumilla, B. Baria, Chandpur
5.3	Field day on modern rice cultivation	To increase farmers knowledge	Three to five field days	Do		Cumilla, B. Baria, Chandpur
5.4	Validation of yield and growth duration of BINA dhan19 and BINA dhan16 along with BRRRI varieties	To validate BINA dhan19 and BINA dhan16 with BRRRI developed short duration Aus and Aman varieties in terms of yield and growth duration.	Variety; Aus: BRRRI dhan48, BRRRI dhan85, BINA dhan19 Aman: BRRRI dhan 62, BRRRI dhan75, BINA dhan16	PI: FHK CI: TF, BS, AKMS, MH, MMR, AI		Cumilla, B. Baria, Chandpur

AI=Aminul Islam, MH=Mohammad Hossain, RS=Rakiba Sultana, MMR=Md. Mamunur Rashid, FHK=Faruk Hossain Khan, AKMS=AKM Shalahuddin, TF=Tasnia Ferdous, BS=Bijoya Saha, IZ= Ishrat Zahan, MAL=Md. Abdul Latif, KMI=Khandoker M Iftekharuddaula, TH=Tahmid Hossain Ansari, MSM=Md. Salim Mian, MK=Mahmuda Khatun, MAIK= M Ashik Iqbal Khan, BN= Bodrun Nessa, AA=Anjuman Ara, SAIN= SAI Nihad, AN= Aminun Nahar, PA= Panna Ali, AB= Adil Badshah, SI= Shahidul Islam, RA= Rumana Aktar, NA= Nasima Aktar