ANNUAL RESEARCH REVIEW WORKSHOP 2023-24

(18-24 January 2025)

Day 5: 23 January 2025

Session IX

BANGLADESH RICE RESEARCH INSTITUTE

Regional Station, Barishal

CONTENTS

SUMMARY

Usefull Scientific Information

BRRI R/S, Barishal is operating a strong breeding program to develop suitable high yielding rice varieties for tidal submergence in T. Aman and favorable Boro seasons. To achieve the goal, forty-five new crosses were made, and fifty-six crosses were confirmed. A total of 5500 progenies from F2 to F4 generation were harvested using FRGA technique during T. Aman 2023.

During Boor 2023-24, total of 17,183 progenies from F2 to F5 generation were harvested using FRGA technique during Boro 2023-24. To explore the attributes of new generation rice (NGR) in exotic populations, 240 plants from 45 hybrid F2 populations were selected for further evaluation in F3 nursery and 290 plant progenies from 1042 F7 hybrid populations were bulked for further evaluation in OYT nursery during Boro 2024-25. Three observational yield trials (OYT) were conducted during Boro 2023-24. One OYT(OYT#1) consisting of 208 advanced breeding lines along with four checks was conducted and out of those 88 lines were selected for their better performances. Another OYT(OYT#2) consisting of 77 entries along with four checks was conducted and out of those 15 entries were selected based on yield and yield contributing traits. In OYT#FBC, 296 entries along with six checks were evaluated and out of those 10 entries were found outyielded over the check varieties. One preliminary yield trial (PYT) was conducted during T. Aman 2023. In PYT, sixteen advanced breeding lines along with five checks were evaluated and better performing six entries were selected for further trials. One PYT was conducted during Boro 2023-24. Eight advanced breeding lines along with three checks were evaluated and based on their better performance 2 lines were selected for further trials. A total of twenty regional yield trials (RYTs) were conducted during 2023-24. Out of those, eight RYTs for T. Aman 2023 (zinc enriched rice, rainfed lowland rice, antioxidant-rich black rice, salt-tolerant rice, low amylose rice and tall materials), twelve RYT for favorable Boro (extra long slender, medium, semi medium and short duration, Bio, zinc enriched rice, PQR, tall, Blast_LD, Blast_MD, Blast_SD and Barishal_FBR). All the tested RYT materials were obtained from BRRI HQ, Gazipur except one from Barishal_FBR. Three advanced yield trials (AYTs) were conducted during T. Aman 2023 and out of those two were for tidal submergence tolerance and one was for high-yielding genotypes. Eight AYTs for the favorable Boro rice variety were conducted during Boro, 2023-24 and those from BRRI R/S, Barishal. Seventeen hybrids of different companies and six checks viz. BRRI dhan74, BRRI dhan89, BRRI dhan92, BRRI hybrid dhan3, BRRI hybrid dhan5 and BRRI hybrid dhan8 were evaluated at Charbadna farm, BRRI R/S, Barishal during Boro 2023-24. None of the tested hybrids was found out-yielded over the highest yielded check variety BRRI hybrid dhan8 (8.55t/ha). The growth duration range of the tested hybrid was 142-148 days whereas for check varieties it was observed 141-149 days. A total of 373 local Aman germplasms were grown in six-line plots for characterization, utilization and maintenance during T. Aman 2023.

In the light trap during 2023-24, the appearance of insect pest was lower than the previous reporting year in BRRI, Barishal. The highest infestation was of yellow stem borer (YSB) followed by green leafhopper (GLH), brown plant hopper (BPH) and white brown leafhopper (WBPH) in the reporting year. In case of natural enemy, the highest staphylinid beetle (STPB) followed by green mirid bug (GMB) and earwig (EW) was observed. Insect pest was trapped higher in the reporting year than natural enemy. The first peak of insect pest infestation was observed in October, November, December 2023 and January 2024 and the second peak in April, May and June 2024. Natural enemy abundance was found higher in January and February 2024. Although insect pest abundance was found throughout the reporting year but higher insect pest was observed in Boro season compared to T. Aman season.

A total of 21 chemicals, including the standard check (Trooper 75WP), were evaluated for their efficacy against leaf blast at BRRI RS, Barishal, during the Boro 2023-24 season. Among the tested chemicals, only 10, including the check (Trooper 75WP), reduced leaf damage by more than 80% compared to the untreated control. These chemicals will be re-evaluated during the T. Aman season for further confirmation. Those chemicals that consistently show over 80% control in both seasons will be recommended to the Plant Protection Wing, DAE, for registration.

To validate and disseminate neck blast disease management practices in the Barishal region, six field trials were established at Jangalia village, Barishal Sadar Upazila, Barishal. The treatment resulted in more than a 70% reduction in neck blast disease incidence and over a 60% increase in yield.

An experiment was conducted in Char Badna farm, BRRI Barishal, during T. Aman 2023. The treatments included the following five urea application methods: (1) prilled urea (PU): 2 splits (½ at 10 DAT + ½ at 7d before PI), (2) PU: 3 splits (1/3rd at 10 DAT + 1/3rd at active tillering + 1/3rd seven days before panicle initiation), (3) PU: full dose as basal, 4) PU: full dose after final recession of flood water, and 5) urea deep placement (UDP) (@10 DAT). Results showed that the application of PU @ 3 splits yielded the highest grain for both varieties (Fig. 14). The full dose of PU as basal, recorded the lowest grain yield indicating a greater loss of the applied fertilizer. A varietal difference was recorded in response to urea application, with BRRI dhan76 being more responsive to late urea applications than BRRI dhan52. Deep urea placement yielded higher grain in shorter duration variety (BRRI dhan52) than in longer duration (BRRI dhan76).

Another experiment was conducted in Char Badna farm in T. Aman 2023 season and Sagordi farm in boro 2023-24 season of BRRI R/S, Barishal aimed at identifying a suitable planting date for short and long duration T. Aman and Boro rice cultivars to maximize grain yield. The results showed that the short duration varieties BRRI dhan75, BRRI dhan87 and BRRI dhan90 seeding on 25th June produced higher grain (2.73 t/ha, 3.63 t/ha, 2.49 t/ha respectively) than the delayed transplanting. In case of long duration varieties BRRI dhan49, and BRRI dhan93 seeding on 25th June gave better yield (3.40t/ha, 3.43t/ha respectively) and BRRI dhan52 higher yielded at 10 July seeding. The results showed that the short duration varieties BRRI dhan88 and BRRI dhan101 seeding on 1 December produced higher grain yield (6.95 t/ha, 8.08 t/ha respectively) and BRRI dhan96 showed better yield on 1 January seeding. In case of long duration varieties BRRI dhan89, BRRI dhan92 and BRRI dhan102 performed better yield (7.23 t/ha, 7.45 t/ha and 8.27 t/ha respectively) on 16November seeding.

From the missing element trial, it was revealed that application of N should not be neglected in Aman season, if optimum rice yield is to be obtained. In Boro season, nitrogen was the most limiting nutrient in the tidal flooded soil.

The single factor experiment consisted of 7 weed management practices namely T_1: Control (No weeding + No herbicide) ,T_2: Weed free (as much HW needed, T_3: Pre-emergence herbicide+ Post-emergence herbicide, T_4: Pre-emergence herbicide + 1 Hand Weeding (HW) at 35-40 Days after transplanting (DAT):,T_5: Post-emergence herbicide + 1 HW at 40-45DAT T_6: 2 HW (1st at 15-20DAT and 2nd at 40-45 DAT) and $T_{7:}$ Mechanical weeding by BRRI weeder(1st at 15-20DAT) + 1 HW at 35-40 DAT). The highest grain yield (8.61t/ha) was recorded in the treatment Post-emergence herbicide + 1 HW at 40-45DAT followed by T_4: Pre-emergence herbicide + 1 Hand Weeding (HW) at 35-40 DAT(7.99t ha^{-1}) and $T_{7:}$ Mechanical weeding by BRRI weeder(1st at 15-20DAT) + 1 HW at 35-40 DAT (7.85t ha^{-1}) . The lowest yield (4.02 t ha^{-1}) was recorded in the treatment T_1: Control (No weeding + No herbicide).

During Aus 2023, fourteen BRRI released varieties were tested following RCB design with three replications. Among the tested 14 varieties BRRI dhan98 gave highest yield (5.33 t/ha) and the lowest yield was observed in BRRI dhan106 (3.1 t/ha). During T. Aman 2023, 48 BRRI released varieties were tested in three groups, namely, short duration (15 nos), medium duration (22 nos) and long duration (11 nos). Among the tested short duration varieties, the highest yield was observed in BRRI dhan95 (4.06 t/ha) and the lowest yield was found in BRRI dhan62 (0.75 t/ha). In medium duration varieties, the highest yield was found in BRRI dhan49 (3.91 t/ha) and the lowest yield was observed in BR3 (1.41 t/ha). Finally, in the long duration varieties, the highest yield was in BRRI dhan91 (3.49 t/ha) followed by BR10 (2.44 t/ha) and the lowest yield was in BRRI dhan37 (1.14 t/ha). Fifty-two (52) varieties were evaluated at Char badna, Barishal during Boro 2023-24. Among the tested short duration varieties, the highest yield was observed in BRRI dhan74 (5.21 t/ha) and the lowest yield was found in BR6 (3.95 t/ha). In case of the long duration varieties, the highest yielder was BR17 (4.86 t/ha) followed by BRRI dhan58 (4.74 t/ha) and BRRI dhan99 (4.55 t/ha). The lowest yield was observed in BRRI dhan50 (3.47 t/ha).

Under rice farming systems program area, different cropping pattern was meticulously observed and identified two cropping patterns for improvement. For increasing productivity of these pattern, several experiments were conducted in farmers field with the assistance of GoB and

PARTNER fund. In Barishal region, *Aus* cultivation is remarkable in Barguna, Patuakhali, Jhalokathi and Bhola district following Fallow-*Aus*-T. *Aman* cropping pattern. Tepu IRRI, Abdul Hye, Monsur IRRI, Gotaillya IRRI, Kalisaitta, Sri Balam, BR21, BR26, BRRI dhan27, BRRI dhan42, BRRI dhan43, BRRI dhan48, BRRI dhan55 are cultivated over years. In Aus 2023, BRRI dhan106 was found highest yield provider variety followed by BRRI dhan98 and BRRI Hybrid dhan7. BRRI dhan106 out yielded 11.7% over the yield of BRRI dhan48 and BRRI Hybrid dhan7. In respect of productivity of this pattern, BRRI dhan98+BRRI dhan103 produced highest total yield 11.87 t/ha in high land, BRRI dhan106+BRRI dhan52 produced highest total yield 11.21 t/ha where BRRI dhan106+BRRI dhan23 produced highest total yield 10.26 t/ha in medium high land: Phase-2 and in medium low land, Aus establishment was not done due to heavy tidal surge, here Nakuchi mota produced 3.9 t/ha.

A total of six ALARTs were conducted at different sites of the Barishal region, including three for T. Aman 2023 (Short duration rice, Swarna type rice and anti-oxidant enriched rice), and three for Boro2023-24(Bacterial Blight, Bacterial Blight+Blast Resistant, Salinity Tolerant Rice). In T. Aman 2023, highest grain yield (3.87 t/ha) was obtained by BR13-7-9-3-2B as short duration rice, BR9396-6-2-2B showed the highest mean grain yield (4.10 t/ha) as Swarna type rice and check variety BRRI dhan70 showed the highest grain yield (2.99 t/ha) as anti-oxidant rice. In Boro 2023-24, advanced line BR(path)13800-BC3-8-1 (5.3 t/ha) showed the highest grain yield as BB resistant BR(path)13800-BC3-134-25 gave the highest yield (7.6 t/ha) as BB and Blast resistant and BR11712-4R-44 (7 t/ha in Barishal and 5.6 ton in Kolapara) and BR11712-4R-93 (7.4 t/ha in Barishal and 5.5 t/ha in Kolapara) showed superior yield performance in both the locations as salinity tolerant rice variety.

New HYV's of BRRI i.e. BRRI dhan44, BRRI dhan52, BRRI dhan72, BRRI dhan76, BRRI dhan77 and BRRI dhan87 were demonstrated in 350 acres of land as block demonstration which covered the 25 upazilas of six districts of Barishal Division under GOB fund during T. Aman 2023 season. The farmers preferred BRRI dhan52 and BRRI dhan76 and wanted to cultivate these varieties for the next year along with neighboring farmers.

A total of 1506 number of demonstrations were conducted where 1050 were both seed and fertilizer supported and rest were supported only seed by BRRI Barishal. The activity covered 806 acres land of 20 Upazilas of Barishal Division during Boro 2023-24 season. Among saline tolerant varieties BRRI dhan97 performed well and farmers liked the variety for its boldness. Farmers also preferred BRRI dhan67 due to its cold tolerance and high fertility percentage.

For breeder seed production, single seedling was transplanted at 20 x 20 cm spacing. BRRI recommended practices for crop cultivation was followed. In Aus, total 4,308 kg TLS seeds were produced in Char badna farm, Barishal. In T. Aman 2023, a total of 26,560 kg and in Boro 2023-24, a total of 32,520 kg breeder seed were produced. In T. Aman 2023, a total of 5,980 kg and in Boro 2023-24, a total of 25,418 kg TLS BRRI released varieties was produced in BRRI, Barishal. Moreover, 46 trainings and 24 field days were conducted by BRRI RS Barishal during this year. Besides, a regional seminar was also arranged in BRRI R/S, Barishal, related to increasing rice production in tidal ecosystem.

Bangladesh Rice Research Institute

Regional Station, Barishal

RESEARCH PERSONNEL

A. Scientific personnel, field and office staff during July 2023-June 2024

Sl. #	Name, Degree and Designation	Working days
1.	Quazi Shireen Akhter Jahan, PhD, PSO & Head*	208
2.	Mohammad Ashik Iqbal Khan, PhD, PSO & Head**	161
3.	Muhammad Sajidur Rahman, PhD, PSO*	83
4.	Priya Lal Biswas, PhD, SSO*	365
5.	Tusher Chakrobarty, MS, SSO	365
6.	Aishik Debnath, SO ****	365
7.	Tomalika Saha, MS, SO	365
8.	Abu Sayem, MS, SO	365
9.	Suhel Mia, MS, SO	365
10.	Md. Motalib Hossain, MS, SO (TRB Project) *	128
11.	Mohammad Jahurol Haque Shamim, Dip-in Ag., FM*	278
12.	Mohammad Majibor Rohaman, FM**	7
13.	Md. Shahidul Islam, Dip-in Engg, SAE	365
14.	Md. Mehadi Hassan, AO	365
15.	Md. Shabuddin, Dip-in Ag., SA	365
16.	Md. Mahamudur Rohaman	365
17.	Md. Sajol Mia, AFM**	117
18.	Md. Muttakin Miah, UDA**	130
19.	Mukul Islam, Accountant	365
20.	Md. Sofiqul Islam, Electrician	365
21.	Md. Rukon Miah, LDA*	253
22.	Ujjal Roy, Driver*	365
23.	Md. Eidrish Ali Bapary, Tractor Driver	365
24.	Md. Mizanur Rohaman, Tilar Driver*	365
25.	Md. Anuwar Hossain, Pump Driver***	335
26.	Md. Nasir Uddin, Pump Driver	365
27.	H m Giuas Uddin, Security Gurd*	365
28.	Md. Lutfor Rohaman, Security Gurd	365
29.	Sonjoy Roy, SAST (Hybrid Rice Project)	365

* Transferred to BRRI HQ/RS; ** Joined BRRI RS Barishal; *** Retired from BRRI; **** Deputation for higher studies

INTRODUCTION

Bangladesh Rice Research Institute (BRRI), Regional Station, Barishal was established in 1970 with two research farms, Sagardi and Charbadna occupying 8.8 and 32.0 ha of land, respectively. It is situated at 22°40′50″ N Latitude and 90°21′25″ E Longitude, and 3.3 m above the sea level. Both the Charbadna and Sagardi farms are representative for tidal wetland research. Charbadna farm is situated on the bank of the river Kirtonkhola. The farms were affected heavily by tidal floods from July-September, 2023. The highest tidal depth was 210 cm at Charbadna farm in September, 2023 (Fig. 3 and Fig. 4). Due to heavy tidal submergence, T. Aman rice was difficult to establish.

The tidal wetlands represent a major unfavorable agro-ecological situation in Bangladesh, covering a large area (about 2 M ha) of tidal flood plain land in the Southern especially the Southern-Western region of the country along the coastline. Most of the areas of Barishal regions are under AEZ 13 (Tidal Floodplain).

In Barishal, total cropland is 834 thousand ha, out of which, 88% is under tidal flood. Under tidal flood area, 80% area is non saline area, while the rest (20%) is saline. Soil texture is dominated by sandy loam, clay and clay loam. The tidal sediment of Sagardi farm contains 1.98% organic matter, 33 mg/kg available P and 0.52 meq/100 g exchangeable K. Thus, the soil becomes rich with plant nutrients by the tidal flood. Generally, the farmers in this area do not use fertilizers in the T. Aman season.

The existence of numerous interconnected tidally active rivers, streams and creeks etc. are the special feature of this region. The major environmental problems affecting crop production in the tidal wetland situation are: (i) daily twice tidal inundation of land over a period of 4-8 months (April-November), (ii) salinity arising from land inundation by saline tidal water in wet season and capillary rise of saline water from shallow saline ground in the dry season of the year (iii) lack of good irrigation facility even though there are good sources of sweet surface water in the canals and rivers in dry season. Other problems include malfunctioning or blocked sluice gates causing insufficient water in the canals, heavy clay soil, excess or late rainfall in the early or late crop season (Fig. 1 and Fig. 2), cultivation of long duration local Aman rice cultivars (prone to damage by high tide), cyclone, high humidity, shorter winter period etc. Additionally, socio-economic problems like unfavorable land tenure systems, high cost of inputs, lack of credit facilities, draft power shortage etc. aggravate the situation in the tidal wetlands.

To overcome food crisis, national thrust is specified to utilize the fallow land for crop production in the southern region. In these areas, generally, farmers cultivate low yielding local rice varieties and do not follow the modern crop production techniques. Hence, the production level is very low. Bangladesh Rice Research Institute has initiated different research and development activities in Barishal region to maximize yield by adopting BRRI technologies.

The major objectives of this station are to develop modern rice varieties especially the submergence tolerant with tall seedling and suitable production technology for the tidal wetland submergence situation. The research activities are executed under different program areas. Production of good quality seeds of newly released and popular rice varieties is also a part of the regular activities. A reasonable amount of breeder seed is also produced here.

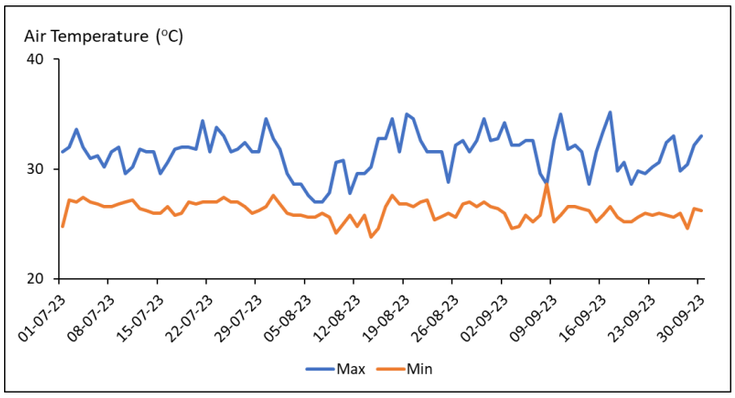


Fig. 1. Maximum and minimum air temperature in BRRI Barishal during July 2023 to June 2024

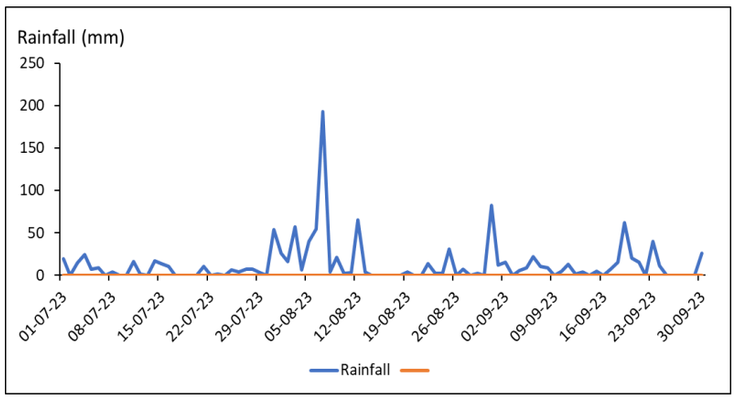


Fig. 2. Daily rainfall in BRRI Barishal during July 2023 to June 2024

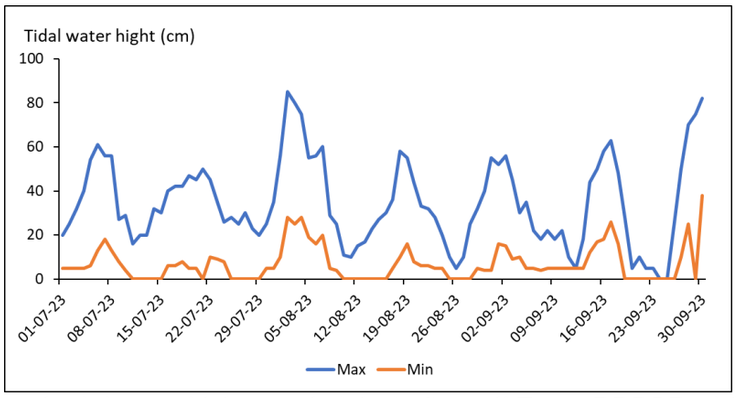


Fig. 3. Maximum and minimum tidal water height in Sagardi Farm, BRRI Barishal during July-September, 2023

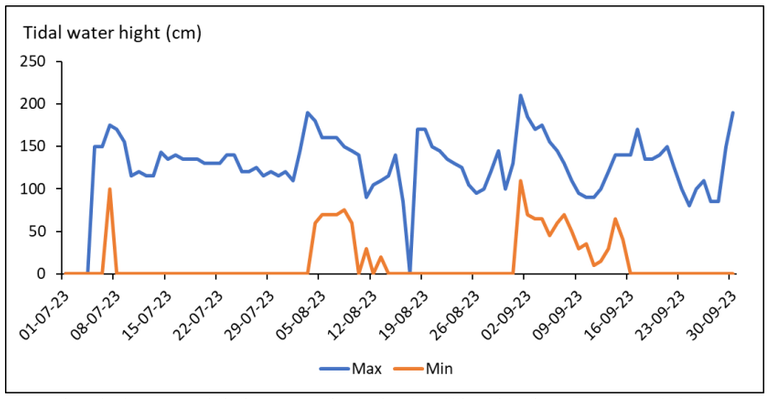


Fig. 4. Maximum and minimum tidal water height in Charbadna Farm, BRRI Barishal during July-September, 2023

I. VARIETAL DEVELOPMENT PROGRAM AREA

Project 1: Development of varieties for tidal submergence ecosystem

T Saha, P L Biswas, Q S A Jahan, MAI Khan

Expt. 1.1. Hybridization, T. Aman 2023

Introduction: As the staple grain of Bangladesh, rice serves as the country's primary source of nutrition. One of the problems with rice development in the southern part of Bangladesh is tidal water. In the Barishal area, research was conducted to develop cultivars for the tidal environment.

Materials and methods: Parents were grown in four sets at seven-day intervals to synchronize flowering times for achieving desired cross combinations. Twenty-five to thirty-days old seedlings were transplanted in a 5.4 m x 5 rows plot with a spacing of 20 x 20 cm. Single seedlings was used for transplanting. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Crop management practices were done as and when necessary.

Results: A total of 29 crosses were made using fifteen parents and 1324 F_1 seeds were obtained during T. Aman 2023 (Table 1).

Table1: List of F_1 seeds produced in T. Aman 2023

Sl	Cross combination	No. of seeds
01	BRRI dhan103 / BRRI dhan87	7
02	BRRI dhan103/ BRRI dhan89	24
03	BRRI dhan87 / BRRI dhan89	17
04	BRRI dhan87 / BRRI dhan103	75
05	BRRI dhan79 / BRRI dhan52	100
06	BRRI dhan87 / BRRI dhan52	53
07	BRRI dhan79 / BRRI dhan77	142
08	BRRI dhan52 / BRBa12-33-2-3-2	7
09	BRRI dhan103 / BRBa12-33-2-3-2	26
10	BRRI dhan52/ BRBa11-5-1-1-3	128
11	BRRI dhan103 / BRBa11-5-1-1-3	28
12	Sahi Balam / BRRI dhan52	85
13	Sahi Balam/ BRRI dhan87	75
14	Sahi Balam / BRRI dhan103	41
15	Shorno goda / BRRI dhan52	94
16	Shorno goda / BRRI dhan87	79
17	Shorno goda / BRRI dhan103	22
18	IR16F1097 / BRRI dhan52	20
19	IR16F1097 / BRRI dhan76	80
20	Shorno goda / BRBa13-47-2-4-1	10
21	Sahi Balam / BRRI dhan76	9
22	BRBa26-1-1-1-2 / BRRI dhan52	18
23	(Moulota / BRRI dhan52) / BRRI dhan52 (Backcross)	47
24	BRRI dhan89 / BRRI dhan77	3
25	BRBa26-1-1-1-2 / BR23	6
26	BRBa26-1-1-1-2 / BRRI dhan76	10
27	BRBa26-1-1-1- 2/ BRRI dhan77	60
28	(Kajolshail / BRRI dhan76) / BRRI dhan76 (Backcross)	28
29	(Kajolshail / BRRI dhan76) / BRRI dhan52 (Backcross)	30
	Total	**1324**

Expt. 1.2. F_1 confirmation of HYV/Local crosses (Tidal submergence), T. Aman 2023

Objective: To confirm F1's as true crosses.

Introduction: Rice is the staple food of Bangladesh and no wonder that it is the main cereal crop in Bangladesh. Tidal water is one of the problems of Rice cultivation in the Southern part of Bangladesh. This experiment was set up in the Barishal region to develop varieties for tidal ecosystems. The study was conducted to confirm F_{1s} as true crosses.

Materials and methods: A total of 33 F_1's was grown during T. Aman, 2023. A single seedling of 30 days old was transplanted in 5.4 m single row plots at a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Crop management practices were done as and when necessary.

Results: Out of 33 crosses, 25 crosses were confirmed and registered in BRRI cross-list with station code BRBa251 to BRBa275 (Table 2).

Table 2: List of confirmed F_1's during T. Aman, 2023

Sl	Cross combination	BRBa No.
1	BRBa23-4-2-1-1-P2 /BRRI dhan52	BRBa251
2	BRBa23-4-2-1-1-P2 / BRBa23-4-3-1-1-P1	BRBa252
3	BRBa13-49-1-5-2 /BRRI dhan49	BRBa253
4	BRBa13-49-1-5-2 / BRRI dhan52	BRBa254
5	BRBa13-49-1-5-2 /BRRI dhan76	BRBa255
6	BRBa13-49-1-5-2 / BRRI dhan77	BRBa256
7	BRRI dhan52 / BRBa11-44-2-2-1	BRBa257
8	BRRI dhan52 / Azij IRRI	BRBa258
9	BRRI dhan87 / BRBa11-44-2-2-1	BRBa259
10	SV1168 / BRRI dhan52	BRBa260
11	BRRI dhan52 / BRRI dhan76	BRBa261
12	BRRI dhan52 / BRRI dhan77	BRBa262
13	BRRI dhan52 / Sorno-masuri	BRBa263
14	BRRI dhan76 / Sahi Balam	BRBa264
15	BRBa23-4-3-1-1-P1 / BRRI dhan52	BRBa265
16	BRBa23-4-3-1-1-P1 / BRRI dhan77	BRBa266
17	BRBa23-4-2-1-1-P2 / Shornogoda	BRBa267
18	Moulata / BRRI dhan52	BRBa268
19	Kajolshail / BRRI dhan76	BRBa269
20	Balam / BRBa13-49-1-5-2	BRBa270
21	BR23 / Mothamata	BRBa271
22	Mothamata / BR23	BRBa272
23	BR9392-12-6-2-4B / BRRI dhan52	BRBa273
24	BR9392-12-6-2-4B / Balam (516)	BRBa274
25	BR9392-12-6-2-4B / Thormuckra	BRBa275

Expt. 1.3. Progeny advancement through FRGA during T. aman 2023

Specific Objective: To rapidly advance segregating populations for shortening the breeding cycle.

Materials and Methods: A total of 9461 segregating progenies from 71 crosses comprising of F_2, F_3, F_4, generations were grown in the field RGA (Rapid Generation Advance) nursery following field RGA technique during T. aman2023. Seeds of the segregating progenies were sown at 5 × 5 cm spacing in the field. Fertilizer management was done using the half doses of all fertilizers used in Experiment 1. At maturity, single panicle was harvested from each plant of each cross. Freshly harvested seeds were dried and broken seed dormancy using the dry heat treatments @ 45°C for 5 d to initiate next cycle of RGA.

Results: During T. Aman 2023, A total of 8220 F2 progenies from 23 crosses were grown following field RGA technique and 4,833 F3 progenies were harvested (Table 3). A total of 517 progenies from F3 generation were grown and 252 progenies of F4 generation were harvested (Table 4). A total of 724 progenies from F4 generation were grown and 415 progenies of F5 generation were harvested under breeding program of high-yielding rice varieties for a non-saline tidal ecosystem. (Table 5). In total 5500 progenies were harvested using the FRGA technique.

Table 3: List of F_3 generation advanced through FRGA, during T. Aman 2023

Sl	BRBa No.	Cross combination	Progenies grown	Progenies harvested
1	BRBa195	BRBa11-44-2-2-1/BRRI dhan41	424	320
2	BRBa196	BRBa11-47-1-3-2/BRRI dhan80	180	64
3	BRBa197	BRBa11-47-1-3-2/BR23	516	362
4	BRBa198	BRBa11-68-1-4-1/BR23	268	172
5	BRBa199	BRBa11-68-1-4-1/BRRI dhan80	324	73
6	BRBa200	BRBa19-48-1-2-2/BRRI dhan41	504	501
7	BRBa201	BRBa19-48-1-2-2/BRRI dhan77	376	163
8	BRBa202	BRBa19-48-1-2-2/BRRI dhan80	76	46
9	BRBa203	BRRI dhan44/BRRI dhan52	460	367
10	BRBa204	BRRI dhan76/BRRI dhan44	460	447
11	BRBa205	BRRI dhan76/BRRI dhan49	464	394
12	BRBa206	BRRI dhan87/BRRI dhan76	464	166
13	BRBa207	Kotiagoni/BRRI dhan41	468	348
14	BRBa208	Kotiagoni/BRRI dhan77	192	103
15	BRBa209	Lambu IRRI/BRRI dhan41	268	223
16	BRBa210	Lambu IRRI/BRRI dhan52	172	92
17	BRBa211	Lambu IRRI/BRRI dhan76	204	55
18	BRBa212	Tapushail/BRRI dhan52	452	166
19	BRBa213	Tapushail/BRRI dhan77	380	100
20	BRBa214	Badshabhog/BRRI dhan52	164	61
21	BRBa215	Badshabhog/BRRI dhan76	324	62
22	BRBa216	Badshabhog/BRRI dhan41	612	229
23	BRBa217	Badshabhog/BRRI dhan80	468	319
		Total	**8,220**	**4833**

Table 4: List of F_4 generation advanced through FRGA, during T. Aman 2023

Sl	BRBa No.	Cross combination	Progenies grown	Progenies harvested
1	BRBa149	Lalpaika/BRRI dhan52	28	28
2	BRBa150	Lalpaika/BRRI dhan76	26	14
3	BRBa151	Lalpaika/BRRI dhan77	24	8

Sl	BRBa No.	Cross combination	Progenies grown	Progenies harvested
4	BRBa152	Local Balam/BRRI dhan52	16	13
5	BRBa153	Moulata/BRRI dhan41	24	14
6	BRBa154	Moulata/BRRI dhan52	20	9
7	BRBa155	Nakuchimota/BRRI dhan52	14	2
8	BRBa156	Nakuchimota/BRRI dhan76	32	10
9	BRBa157	Nakuchimota/BRRI dhan77	9	3
10	BRBa158	Sada Pajam/BR23	20	10
11	BRBa159	Sada Pajam/BR8442-12-1-3-1-B5	24	12
12	BRBa160	Sada Pajam/BRRI dhan52	20	13
13	BRBa161	Sada Pajam/BRRI dhan76	8	7
14	BRBa162	Sada Pajam/BRRI dhan77	24	20
15	BRBa163	Sada Pajam/BRRI dhan87	16	14
16	BRBa164	Sadachikon/BRRI dhan52	20	2
17	BRBa165	Sadachikon/BRRI dhan76	24	2
18	BRBa166	Sadamota/ BRRI dhan78	24	3
19	BRBa167	Sadamota/BRRI dhan76	24	1
20	BRBa168	Sahi Balam/BR23	20	7
21	BRBa169	Sahi Balam/BRRI dhan41	24	2
22	BRBa170	Sahi Balam/BRRI dhan52	20	17
23	BRBa171	Sahi Balam/BRRI dhan76	28	20
24	BRBa172	Sahi Balam/BRRI dhan77	28	21
		Total	**517**	**247**

Table 5: List of F_5 generation advanced through FRGA, during T. Aman 2023

Sl	BRBa No.	Cross combination	Progenies grown	Progenies harvested
1	BRBa125	BR 23/Motha dhan	12	2
2	BRBa126	BRRI dhan52/Lalchikon	40	3
3	BRBa127	BRRI dhan76/Chaulamagi	44	18
4	BRBa128	BRRI dhan76/Kotiagoni	60	13
5	BRBa129	BRRI dhan76/Motha dhan	8	8
6	BRBa130	Lalchikon/BRRI dhan76	12	5
7	BRBa131	BRRI dhan77/Chaulamagi	12	3
8	BRBa132	BRRI dhan77/Dudmona	12	4
9	BRBa133	BINA dhan-11/Dudmona	40	2
10	BRBa134	IR 103795-B-B-2-1/Bashful	48	35
11	BRBa135	IR 18028-B-B-B-1-B-B/Lalchikon	40	16
12	BRBa136	BR 23/BRRIdhan87	56	41
13	BRBa137	BRRI dhan52/BR 10	60	54

Sl	BRBa No.	Cross combination	Progenies grown	Progenies harvested
14	BRBa138	BRRI dhan52/BRRI dhan87	32	30
15	BRBa139	BRRI dhan52/IR13 A 515	32	27
16	BRBa140	BRRI dhan52/IR 87959-6-2-3-1-2-BAY B-CMU 1	20	15
17	BRBa141	BRRI dhan76/ BR 10	40	32
18	BRBa142	BRRI dhan77/BR 10	56	54
19	BRBa143	BRRI dhan77/BRRI dhan87	16	2
20	BRBa144	BRRI dhan77/IR 13 A 515	16	8
21	BRBa145	BRRI dhan77/IR 16 F 1405	12	2
22	BRBa146	BRRI dhan77/IR 64-Pish	20	15
23	BRBa147	IR 64-Pizt/BRRI dhan34	24	19
24	BRBa148	PB-1 (US)/Hori dhan	12	7
		Total	**724**	**415**

PROJECT 2: Rice Breeding for Favorable Condition

T Saha, P L Biswas, Q S A Jahan, MAI Khan

Expt. 2.1. Hybridization, Boro 2023-24

Introduction

Rice is the cornerstone of Bangladesh's food security, serving as the primary dietary staple for its population. To sustain and enhance agricultural productivity, a key objective in rice breeding programs is to develop high-yielding varieties. Under optimal growing conditions, these High-Yielding Varieties (HYVs) should demonstrate their maximum yield potential.

Objective: To develop high yield potential Boro varieties that will be adaptable to favourable ecosystem in Barishal.

Materials and methods: Parents were grown in three sets at seven days interval to synchronize flowering times for achieving desired cross combinations. Forty-five-day-old seedlings were transplanted in a 5.4 m x 5 rows plot with a spacing of 20 x 20 cm. Single seedlings was used for transplanting. Fertilizers were applied @ 280:100:120: 110:10 kg/ha urea, triple super phosphate, muriate of potash, gypsum and zinc sulphate, respectively. Urea was applied in three equal splits at 15-day intervals starting from 15 DAT. Full doses of TSP, MoP, gypsum and zinc sulfate were applied during final land preparation. Crop management practices were done as and when necessary.

Results: A total of 16 crosses were done using eight parents and 1391 F1 seeds were obtained to develop high-yielding Boro rice varieties during Boro 2023-24 (Table 6).

Table 6. List of F_1 seeds produced in Boro 2023-24

Sl. No.	Cross combination	No. of seeds
01	NGR 350-2/ BRRI dhan74	27
02	NGR 1256-1/BRRI dhan89	55
03	NGR 1256-1/NGR 350-2	21
04	NGR 1256-1/ BRRI dhan74	104
05	NGR 1256-1/ BRBa21-13-2-2-1	43
06	BRBa21-13-2-2-1/NGR 1256-1	90
07	NGR 1256-1/NGR 324-1	110
08	NGR 325-1 /NGR 350-2	65
09	NGR 325-1 /NGR 1256-1	69
10	BRBa21-13-2-2-1/NGR 350-2	126
11	BRBa21-13-2-2-1/NGR 325-1	54
12	NGR 325-1 / BRBa21-13-2-2-1	138

Sl. No.	Cross combination	No. of seeds
13	NGR 325-1 /BRRI dhan102	131
14	NGR 325-1 /BRRI dhan89	138
15	NGR 1256-1/NGR325-1	155
16	NGR 324-1/NGR325-1	65
	Total	**1391**

Expt. 2.2: F_1 Confirmation during Boro 2023-24

Objective: To confirm F_{1s} as true crosses.

Materials and methods: A total of 43 F_1's was grown during Boro, 2023-24. Single seedlings at the age of 41 days were transplanted in 5.4 m single-row plots at a spacing of 20 cm x 20 cm. Fertilizer doses were 280:100:120:110:10 kg/ha N-P-K-S respectively, with the split application of N (40+20+20 kg/ha). Full doses of P, K and S were applied during final land preparation. Crop management practices were done as and when necessary.

Results: Out of 43 crosses, 31 crosses were confirmed and registered in BRRI cross-list with station code from BRBa276 to BRBa306 (Table 7).

Table 7. List of confirmed F_1's during Boro, 2023-2024

Sl.	Cross combination	BRBa Code
1	NGR 467-2/BRRI dhan92	BRBa276
2	NGR 522-2/BRRI dhan74	BRBa277
3	NGR 224-1/ BRRI dhan89	BRBa278
4	NGR 325-1/ BRRI dhan89	BRBa279
5	NGR 758-1/ BRRI dhan84	BRBa280
6	BRBa1-4-9/ BRRI dhan84	BRBa281
7	BRBa3-4-7/ BRRI dhan84	BRBa282
8	BRBa2-5-3/ BRRI dhan84	BRBa283
9	NGR 1394-2/ BRRI dhan92	BRBa284
10	BRRI dhan84/ NGR 325-1	BRBa285
11	NGR 736-1/ BRRI dhan89	BRBa286
12	NGR 736-1/ BRRI dhan92	BRBa287
13	NGR994-1 / BRRI dhan74	BRBa288
14	NGR 1255-1/ BRRI dhan74	BRBa289
15	NGR 1019-1/BRRI dhan89	BRBa290
16	NGR 1019-2/BRRI dhan74	BRBa291
17	BRRI dhan74/BRBa1-4-9	BRBa292
18	BRRI dhan74/ BRBa3-4-7	BRBa293
19	BRRI dhan74/ BRBa2-5-3	BRBa294
20	BRRI dhan89/NGR 730-1	BRBa295
21	BRRI dhan89/ NGR 1025-1	BRBa296
22	BRRI dhan89/ NGR 1019-1	BRBa297
23	NGR994-1/ BRRI dhan92	BRBa298
24	NGR 325-1/BRRI dhan92	BRBa299

Sl.	Cross combination	BRBa Code
25	NGR 758-1/BRRI dhan89	BRBa300
26	NGR 1210-3/ BRRI dhan89	BRBa301
27	NGR 1025-1/ BRRI dhan89	BRBa302
28	NGR 730-1/ BRRI dhan74	BRBa303
29	NGR 527-1/ BRRI dhan89	BRBa304
30	NGR 1019-2/BRRI dhan89	BRBa305
31	NGR 1019-2/ BRRI dhan92	BRBa306

Expt. 2.3. Progeny advancement through FRGA during Boro 2023-24

Specific Objective: To rapidly advance segregating populations for shortening the breeding cycle.

Materials and Methods: A total of 17,647 segregating progenies from 73 crosses comprising of F_2 and F_5 generations were grown in the field RGA (Rapid Generation Advance) nursery following field RGA technique during Boro 2023-24. Seeds of the segregating progenies were sown at 5 × 5 cm spacing in the field. Fertilizer management was done using the half doses of all fertilizers used in Experiment 1. At maturity, a single panicle was harvested from each plant of each cross. Freshly harvested seeds were dried and broken seed dormancy using the dry heat treatments @ 45°C for 5 d to initiate next cycle of RGA.

Results: During Boro 2023-24, A total of 16,144 F2 progenies from 33 crosses were grown following field RGA technique and 15,869 F3 progenies were harvested (Table 8). A total of 1503 progenies from F5 generation were grown and 1314 progenies of F6 generation were harvested under a breeding program of high-yielding rice varieties for a favorable ecosystem. (Table 9). In total 17,183 progenies were harvested using the FRGA technique.

Table 8: List of F_3 generation advanced through FRGA, during Boro 2023-24

Sl.	BRBa Code	Cross combination	Progenies planted	Progenies harvested
1	BRBa218	BRBa 2-5-3/BRRI dhan29	560	560
2	BRBa219	BRBa 2-5-3/BRRI dhan67	560	553
3	BRBa220	BRBa 2-5-3/BRRI dhan74	560	560
4	BRBa221	BRBa 2-5-3/BRRI dhan89	560	560
5	BRBa222	BRBa 2-5-3/BRRI dhan92	560	559
6	BRBa223	BRBa 3-1-7/BRRI dhan29	560	560
7	BRBa224	BRBa 3-1-7/BRRI dhan58	560	547
8	BRBa225	BRBa 3-1-7/BRRI dhan67	560	557
9	BRBa226	BRBa 3-1-7/BRRI dhan89	560	560
10	BRBa227	IR12A 2854/BRBa 5-4-1	560	560
11	BRBa228	IR12A 2854/BRRI dhan29	464	458
12	BRBa229	IR12A 2854/BRRI dhan89	440	439
13	BRBa230	IR12A 2854/Kataribhog	560	556
14	BRBa231	IR13A 515/BRRI dhan58	388	386
15	BRBa232	IR13A 515/BRRI dhan67	348	348
16	BRBa233	IR13A 515/BRRI dhan89	540	540
17	BRBa234	NGR 1255-2/BRRI dhan29	376	376
18	BRBa235	NGR 1255-2/BRRI dhan89	360	360

Sl.	BRBa Code	Cross combination	Progenies planted	Progenies harvested
19	BRBa236	NGR 1255-2/Kataribhog	560	555
20	BRBa237	NGR 1258-2/BRBa 23-2-3-1-2-P1	496	496
21	BRBa238	NGR 1258-2/BRRI dhan29	148	143
22	BRBa239	NGR 1258-2/BRRI dhan89	480	464
23	BRBa240	NGR 1258-2/Kataribhog	440	440
24	BRBa241	NGR 1277-1/BRBa 23-2-3-1-2-P1	520	449
25	BRBa242	NGR 1277-1/BRRI dhan29	140	140
26	BRBa243	NGR 736-1/BRRI dhan29	560	544
27	BRBa244	NGR 736-1/BRRI dhan89	492	492
28	BRBa245	NGR 736-1/BRRI dhan92	440	435
29	BRBa246	NGR 736-1/Kataribhog	560	551
30	BRBa247	SVIN 269/BRRI dhan67	560	516
31	BRBa248	SVIN 269/BRRI dhan74	560	547
32	BRBa249	SVIN 269/BRRI dhan89	552	514
33	BRBa250	SVIN 269/BRRI dhan92	560	544
		Total	**16,144**	**15,869**

Table 9: List of F_6 generation advanced through FRGA, during Boro 2023-24

Sl.	BRBa Code	Cross combination	Progenies planted	Progenies harvested
1	BRBa78	NGR 1-5/BRRI dhan58	14	11
2	BRBa79	NGR 1-5/BRRI dhan67	73	55
3	BRBa80	NGR 2-1/BRRI dhan67	50	50
4	BRBa81	NGR 5-1/BRRI dhan29	109	109
5	BRBa82	NGR 22-2/BRRI dhan50	25	25
6	BRBa83	NGR 43-1/BRRI dhan29	102	99
7	BRBa84	NGR 43-1/BRRI dhan58	42	42
8	BRBa85	NGR 99-2/BRRI dhan50	34	34
9	BRBa86	NGR 99-3/BRRI dhan29	33	33
10	BRBa87	NGR 105-2/BRRI dhan29	23	19
11	BRBa88	NGR 105-2/BRRI dhan50	35	35
12	BRBa89	NGR 109-1/BRRI dhan89	29	29
13	BRBa90	NGR 445-2/BRRI dhan47	38	31
14	BRBa91	NGR 445-2/BRRI dhan74	60	60
15	BRBa94	NGR 938-2/BRRI dhan86	59	59
16	BRBa95	NGR 991-3/BRRI dhan67	15	15
17	BRBa96	NGR 991-3/BRRI dhan89	14	14
18	BRBa97	NGR 1020-1/BRRI dhan29	4	4
19	BRBa98	NGR 1020-1/BRRI dhan58	16	13
20	BRBa99	NGR 1346-2/BRRI dhan67	33	33
21	BRBa100	NGR 1346-2/BRRI dhan89	32	32
22	BRBa101	BRBa 2-5-3/BRRI dhan47	82	77
23	BRBa102	BRBa 2-5-3/BRRI dhan89	55	55
24	BRBa103	BRBa 2-5-3/AKT6	7	7
25	BRBa104	BRBa 2-5-3/MK630	18	18
26	BRBa105	BRBa 2-9-4/BRRI dhan58	36	30
27	BRBa106	BRBa 2-9-4/BRRI dhan67	47	47
28	BRBa107	BRBa 2-9-4/BRRI dhan74	54	54
29	BRBa108	BRBa 2-9-4/MK628	37	28

Sl.	BRBa Code	Cross combination	Progenies planted	Progenies harvested
30	BRBa109	BRBa 2-9-4/MK630	32	32
31	BRBa110	BRBa 3-2-6/BRRI dhan47	59	59
32	BRBa111	BRBa 3-2-6/BRRI dhan74	26	26
33	BRBa112	BRBa 3-2-6/MK628	21	21
34	BRBa113	BRBa 3-2-6/MK630	37	20
35	BRBa114	BRBa 3-3-3/BRRI dhan58	3	3
36	BRBa116	BR 9943-35-2-1-2-B2/BRRI dhan74	4	4
37	BRBa117	BR 9943-35-2-1-2-B2/BRRI dhan89	2	2
38	BRBa118	BR 9943-35-2-1-2-B2/AKT6	10	10
39	BRBa120	BR (Bio) 11447-1-28-14-1/MK628	9	9
40	BRBa121	BR (Bio) 11447-1-28-14-1/MK630	10	10
		Total	**1503**	**1314**

Figure 1. FRGA Technique Implementation at BRRI, Barishal (T. Aman 2023)

PROJECT 3: BREEDING FOR NEW GENERATION RICE (NGR)

P L Biswas, T Saha, Q S A Jahan and MAI Khan

Sub-Project 3.1. Introgression of Dense and Erect Panicle in Indica Rice (*Oryza sativa* L.) to Improve Plant Architecture

Expt. 3.1.1. Growing of F_3 generation (SCA hybrids) during Boro 2023-24

Introduction: Improving the plant architecture is a need of the time, which is an accessible approach to increase yield potential, as evidenced by the increased grain yield by the introduction of the semi-dwarf gene into modern cultivars.

Objective: This study was aimed to select better progenies having dense and erect panicles for further evaluation in F_4 nursery.

Materials and methods: A total of 45 F_3 plant progenies were grown during Boro 2023-24 Single seedlings of the age of 35 days were transplanted with a spacing of 20 cm x 20 cm. Unit plot size was 3.24m^2. Fertilizers were applied @ 280:100:120:110:10 kg/ha urea: triple super phosphate: muriate of potash: gypsum: zinc sulphate, respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full doses of TSP, MoP, Gypsum and Zinc sulphate were applied during final land preparation. Crop management practices were done as and when necessary.

Results: Two hundred and forty plant progenies were selected for further generation advance as F_4 (Table 10).

Table 10. List of plant progenies selected from F_3 for further process (F_4) during Boro 2023-24

Sl.	Pedigree	Plant selected	Sl.	Pedigree	Plant selected	Sl.	Pedigree	Plant selected
1	H-1527-1	3	13	H-1540-1	7	25	H-1554-1	8
2	H-1528-1	3	14	H-1541-1	9	26	H-1555-1	4
3	H-1529-1	8	15	H-1542-1	7	27	H-1556-1	4
4	H-1530-1	5	16	H-1543-1	5	28	H-1557-1	3
5	H-1531-1	12	17	H-1544-1	10	29	H-1559-1	2
6	H-1532-1	8	18	H-1545-1	3	30	H-1561-1	4
7	H-1534-1	7	19	H-1548-1	1	31	H-1562-1	3
8	H-1535-1	5	20	H-1549-1	4	32	H-1564-1	10
9	H-1536-1	8	21	H-1550-1	4	33	H-1566-1	6
10	H-1537-1	16	22	H-1551-1	6	34	H-1569-1	3
11	H-1538-1	4	23	H-1552-1	11	35	H-1570-1	25
12	H-1539-1	11	24	H-1553-1	9	36	H-1571-1	2
	Total							**240**

Expt. 3.1.2. Growing of F_7 generation (SCA hybrids) during Boro 2023-24

P L Biswas, T Saha, Q S A Jahan and MAI Khan

Introduction: Moving forward, plant design may be a necessary approach to maximize yield potential, as demonstrated by the increased grain yield achieved through the introduction of semi-dwarf traits into advanced cultivars.

Objective: This study was aimed to select better progenies having dense and erect panicle for further evaluation in OYT trial.

Materials and methods: A total of 1042 F_7 plant progenies of 47 hybrids were grown during Boro 2023-24. Single seedlings of the age of 40 days were transplanted in 5.4 m single-row plots with a spacing of 20 cm x 20 cm. Fertilizers were applied @ 280:100:120:110:10 kg/ha urea: triple super phosphate: muriate of potash: gypsum: zinc sulphate, respectively. Urea was applied in three equal splits at 15 days intervals starting from 15 DAT. Full doses of TSP, MoP, Gypsum and Zinc sulphate were applied during final land preparation. Crop management practices were done as and when necessary

Results: Two hundred and ninety (290) plant progenies were selected and bulked for further evaluation in the OYT trial (Table 11).

Table 11. List of plant progenies selected and bulked from F_7 for further process (OYT) during Boro 2023-24

Sl	Designation	Sl	Designation	Sl	Designation
1	H1278-1-1-2-2-1	98	H1322-5-3-3-2-1	195	H1334-2-2-1-2-1
2	H1278-3-1-1-2-1	99	H1322-5-4-1-1-1	196	H1334-4-3-1-2-1
3	H1279-2-1-2-2-1	100	H1322-5-4-2-1-2	197	H1334-6-2-1-3-1
4	H1280-3-2-2-3-2	101	H1322-8-2-1-2-1	198	H1334-7-2-1-3-1
5	H1280-4-1-2-2-1	102	H1322-8-2-1-2-2	199	H1334-14-1-1-2-1
6	H1280-5-2-1-3-1	103	H1323-1-1-2-1-1	200	H1334-15-2-2-1-1
7	H1280-6-1-1-2-2	104	H1323-1-2-2-4-1	201	H1335-3-1-1-3-1
8	H1280-8-1-1-1-1	105	H1323-4-1-1-3-1	202	H1335-3-4-1-1-1
9	H1280-14-3-1-1-1	106	H1323-4-1-1-3-2	203	H1335-5-1-1-1-1
10	H1280-15-2-1-1-1	107	H1323-4-1-1-3-1	204	H1335-9-1-1-2-1
11	H1280-17-1-2-2-1	108	H1323-4-1-2-2-1	205	H1335-9-1-1-2-2
12	H1283-1-1-1-1-1	109	H1323-6-1-2-2-1	206	H1336-1-2-1-3-2
13	H1283-1-2-1-2-1	110	H1323-7-2-1-3-1	207	H1336-1-2-1-3-4
14	H1284-2-4-1-2-1	111	H1323-7-2-2-2-2	208	H1336-1-2-3-3-2
15	H1284-2-5-2-1-2	112	H1324-1-1-1-2-1	209	H1336-5-1-2-1-2
16	H1286-1-2-1-2-1	113	H1324-1-1-1-2-2	210	H1336-6-1-1-1-1

Sl	Designation	Sl	Designation	Sl	Designation
17	H1286-3-3-2-3-1	114	H1325-1-1-1-4-1	211	H1336-6-1-1-1-2
18	H1287-1-4-1-1-2	115	H1325-1-1-1-4-2	212	H1337-2-1-1-3-1
19	H1287-3-2-1-1-2	116	H1325-1-1-2-2-1	213	H1337-2-3-1-1-3
20	H1287-4-2-1-2-1	117	H1326-2-3-1-4-1	214	H1337-2-4-1-2-1
21	H1287-5-1-1-4-1	118	H1326-2-4-2-3-1	215	H1337-2-4-1-3-3
22	H1288-2-1-2-1-1	119	H1326-5-4-1-1-1	216	H1337-2-5-1-1-1
23	H1288-3-2-2-4-1	120	H1326-12-1-1-1-1	217	H1337-2-5-1-1-2
24	H1289-6-1-1-4-1	121	H1326-12-1-1-1-2	218	H1337-3-1-1-2-1
25	H1289-7-1-2-3-1	122	H1326-14-2-2-3-1	219	H1337-3-1-1-2-2
26	H1291-3-2-2-2-1	123	H1326-16-3-1-1-2	220	H1337-4-1-2-2-1
27	H1291-4-1-1-3-1	124	H1326-16-6-1-1-4	221	H1337-4-1-2-2-2
28	H1291-5-2-1-2-1	125	H1326-17-1-1-3-1	222	H1337-4-1-3-3-3
29	H1291-6-2-1-4-1	126	H1327-1-2-1-2-1	223	H1337-4-1-3-5-1
30	H1292-1-2-1-6-2	127	H1327-1-3-1-2-1	224	H1337-4-1-3-4-2
31	H1292-2-1-1-4-1	128	H1327-2-1-2-3-1	225	H1337-4-1-3-4-3
32	H1293-3-2-2-1-1	129	H1327-2-2-1-2-1	226	H1337-4-2-1-1-1
33	H1293-4-2-1-3-1	130	H1327-2-3-1-3-2	227	H1337-5-1-1-2-2
34	H1293-5-1-1-1-1	131	H1327-3-1-1-1-1	228	H1337-5-1-1-2-3
35	H1295-2-1-1-3-1	132	H1327-4-4-1-2-1	229	H1337-5-1-1-3-1
36	H1295-3-1-2-3-1	133	H1327-4-4-2-2-1	230	H1337-5-2-1-1-1
37	H1296-4-4-2-1-1	134	H1327-4-4-2-2-2	231	H1337-5-2-1-1-2
38	H1297-2-4-1-2-1	135	H1327-5-1-1-3-3	232	H1337-6-2-1-2-1
39	H1297-4-2-1-3-1	136	H1327-6-1-1-3-2	233	H1337-6-2-2-2-1
40	H1298-1-1-2-1-1	137	H1327-7-1-1-3-2	234	H1337-6-2-2-2-2
41	H1298-2-3-1-6-1	138	H1327-7-4-1-2-1	235	H1337-8-4-1-3-2
42	H1298-3-1-1-1-2	139	H1327-11-3-1-3-1	236	H1337-8-4-1-3-3
43	H1298-4-2-1-4-1	140	H1327-11-3-1-3-2	237	H1337-8-4-1-3-1
44	H1299-1-2-1-4-1	141	H1328-4-1-2-4-1	238	H1337-8-4-1-4-2
45	H1299-2-3-2-2-1	142	H1328-4-1-2-4-2	239	H1337-9-1-1-1-1
46	H1306-1-1-1-2-1	143	H1328-4-1-5-2-4	240	H1337-11-3-1-1-1
47	H1306-2-3-1-5-1	144	H1329-1-1-1-4-1	241	H1337-11-4-2-1-1
48	H1306-3-3-1-3-2	145	H1329-1-1-1-4-2	242	H1338-1-4-1-2-2
49	H1306-4-4-1-2-1	146	H1329-3-2-1-2-2	243	H1338-2-3-2-2-1
50	H1306-4-4-1-2-4	147	H1329-6-3-2-3-1	244	H1338-2-3-2-2-2
51	H1306-6-2-1-2-2	148	H1329-6-3-2-3-3	245	H1338-4-1-1-1-2
52	H1310-1-2-1-3-1	149	H1329-9-1-1-3-2	246	H1338-4-1-2-1-1
53	H1310-1-4-2-1-1	150	H1329-11-3-2-3-1	247	H1338-7-4-2-3-1
54	H1310-3-2-1-1-1	151	H1329-11-3-2-3-2	248	H1338-7-4-2-3-2
55	H1310-3-6-1-1-3	152	H1329-11-4-1-5-3	249	H1338-7-4-2-3-3
56	H1310-4-1-1-1-1	153	H1330-1-1-1-3-5	250	H1338-8-3-1-1-1
57	H1310-4-5-1-2-4	154	H1330-1-1-1-3-6	251	H1338-8-3-1-1-2
58	H1312-1-2-1-4-2	155	H1330-1-2-1-3-1	252	H1338-8-3-1-1-3
59	H1312-1-2-1-4-1	156	H1330-1-2-2-2-3	253	H1338-8-3-1-1-4
60	H1312-2-2-1-3-1	157	H1330-3-1-3-1-1	254	H1338-9-1-1-2-2
61	H1312-2-4-1-4-3	158	H1330-3-1-3-1-2	255	H1338-9-1-1-2-3
62	H1312-2-4-1-4-2	159	H1330-3-2-1-2-1	256	H1338-9-3-1-3-2
63	H1312-3-4-1-1-2	160	H1330-3-2-2-2-1	257	H1338-9-3-2-5-1
64	H1312-4-1-1-2-1	161	H1330-3-2-2-2-2	258	H1338-9-3-2-5-2
65	H1312-5-1-2-2-1	162	H1330-3-3-1-5-5	259	H1339-1-1-3-2-1
66	H1312-5-1-3-3-1	163	H1330-3-3-1-5-6	260	H1339-1-1-3-2-2
67	H1315-1-4-1-1-3	164	H1330-4-1-1-5-2	261	H1339-1-3-2-1-1
68	H1315-1-4-2-1-2	165	H1330-4-1-1-5-3	262	H1339-1-3-2-1-2

Sl	Designation	Sl	Designation	Sl	Designation
69	H1315-3-1-1-2-2	166	H1330-4-2-3-3-1	263	H1339-4-1-1-2-1
70	H1315-3-1-1-2-3	167	H1330-4-3-1-4-4	264	H1339-5-3-1-1-2
71	H1315-3-2-1-4-3	168	H1330-4-3-1-5-1	265	H1339-5-4-1-1-1
72	H1315-4-1-1-5-1	169	H1331-1-7-1-3-1	266	H1340-2-1-2-2-1
73	H1315-4-1-1-5-1	170	H1331-1-7-1-3-2	267	H1340-2-1-2-2-2
74	H1315-4-1-1-5-3	171	H1331-2-2-1-4-2	268	H1340-2-2-1-2-1
75	H1315-4-3-1-4-1	172	H1331-2-2-2-4-1	269	H1340-3-1-1-2-1
76	H1315-7-1-1-3-1	173	H1331-4-2-3-3-1	270	H1340-5-3-1-4-1
77	H1317-2-1-1-1-2	174	H1331-5-1-2-3-1	271	H1340-5-3-1-4-2
78	H1317-2-2-1-1-2	175	H1331-5-1-2-3-2	272	H1340-5-3-3-2-1
79	H1318-2-2-1-2-1	176	H1331-6-1-4-1-1	273	H1340-5-3-4-4-2
80	H1321-3-2-1-1-1	177	H1331-6-3-1-1-1	274	H1340-5-5-1-3-2
81	H1321-3-2-2-1-1	178	H1332-1-3-1-2-1	275	H1340-6-1-1-3-1
82	H1321-4-2-1-6-1	179	H1332-1-3-1-2-2	276	H1340-6-1-1-3-2
83	H1321-4-2-1-6-2	180	H1332-2-2-1-3-1	277	H1340-6-3-2-4-1
84	H1321-5-6-1-2-1	181	H1332-4-1-2-3-1	278	H1340-7-3-1-2-2
85	H1321-5-6-2-4-1	182	H1332-4-2-1-3-2	279	H1340-7-4-1-2-1
86	H1322-1-2-2-1-1	183	H1332-8-1-2-1-2	280	H1340-7-4-1-2-2
87	H1322-1-3-1-1-2	184	H1332-8-2-1-3-1	281	H1340-7-6-1-3-2
88	H1322-2-3-1-3-1	185	H1332-9-1-2-4-1	282	H1340-7-6-1-3-4
89	H1322-2-3-1-3-3	186	H1332-9-1-2-4-2	283	H1340-9-4-1-3-1
90	H1322-2-5-1-1-1	187	H1332-15-1-3-3-1	284	H1341-1-1-1-2-1
91	H1322-3-2-1-1-1	188	H1332-15-3-3-2-2	285	H1341-1-1-3-2-1
92	H1322-4-2-1-2-2	189	H1333-4-2-1-3-2	286	H1341-1-1-3-2-2
93	H1322-4-2-2-1-1	190	H1333-5-2-2-3-1	287	H1341-2-2-2-1-1
94	H1322-4-4-1-2-1	191	H1333-5-3-1-4-1	288	H1341-6-1-1-2-1
95	H1322-4-6-1-3-1	192	H1333-7-1-3-3-1	289	H1341-7-1-1-3-2
96	H1322-4-6-2-1-1	193	H1333-7-2-1-5-1	290	H1341-8-1-1-1-1
97	H1322-5-3-1-1-1	194	H1333-8-4-1-2-1		

PROJECT 4: YIELD TRIAL (YT), 2023-24

T Saha, P L Biswas, Q S A Jahan and MAI Khan

Expt. 4.1.1 Observational Yield Trial (OYT#1), Boro 2023-24

Objective: The study was conducted with the objectives to select suitable fixed lines for Boro season with dense and erect panicle, strong culm, high yield potential and disease as well as insect resistant at field condition for further evaluation in the preliminary yield trial nursery (PYT).

Materials and methods: A total of 208 fixed lines of along with Four checks (BRRI dhan74, BRRI dhan89, BRRI dhan101, and BRRI dhan102) were grown following the augmented design (Table 12). Single seedling of 37 days old was transplanted in 5.4 m x 1 m plots at a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg urea, triple super phosphate, muriate of potash, gypsum and zinc sulphate/ha, respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full doses of TSP, MoP, gypsum and zinc sulphate were applied during final land preparation. Other cultural practices were done as and when necessary.

Results: Based on phenotypic acceptability (4-5) and grain yield performance eighty-eight genotypes were selected for further evaluation. Selected genotypes were found out-yielded (10.30-67.02%) over the highest yielding check variety BRRI dhan101 (5.5t/ha). The genotype BRBa76-7-3-1-1 gave the highest yield (9.19t/ha) with a growth duration of 139 days which is similar to the highest yielded check variety BRRI dhan101.

Table 12. Yield and ancillary characters of selected OYT materials, Boro 2023-24.

Sl	Designation	GD (days)	PH (cm)	ET (no.)	Yield(t/ha)
1	BRBa73-2-2-1-5	139	101	11	6.46
2	BRBa73-2-3-2-2	160	104	9	6.14
3	BRBa73-6-4-1-3	153	99	10	6.32
4	BRBa73-22-2-1-1	153	114	8	6.38
5	BRBa73-22-4-1-2	160	110	13	6.07
6	BRBa73-33-2-1-1	139	127	12	6.26
7	BRBa73-33-7-1-1	153	113	10	6.20
8	BRBa73-34-1-1-2	153	119	13	7.28
9	BRBa73-35-1-1-2	153	125	12	6.52
10	BRBa73-35-2-1-1	153	124	11	6.60
11	BRBa73-35-2-1-2	153	124	12	6.49
12	BRBa73-35-2-1-4	153	122	15	7.68
13	BRBa73-36-1-1-3	139	109	14	7.12
14	BRBa73-40-1-1-3	139	118	16	6.56
15	BRBa73-45-5-1-1	153	105	11	7.21
16	BRBa73-46-2-1-1	153	107	9	6.96
17	BRBa73-46-5-1-1	153	111	11	6.23
18	BRBa73-47-1-2-3	139	119	13	7.33
19	BRBa73-48-1-1-3	160	116	13	6.82
20	BRBa73-48-7-1-1	160	113	15	7.03
21	BRBa73-49-5-1-1	160	113	13	6.46
22	BRBa73-49-7-2-2	153	106	11	6.21
23	BRBa73-47-1-2-1	153	118	16	7.50
24	BRBa73-50-5-1-1	153	118	11	7.65
25	BRBa73-50-6-1-1	153	111	10	6.91
26	BRBa73-54-3-1-4	153	113	11	6.96
27	BRBa73-60-1-1-2	139	104	13	7.15
28	BRBa73-61-4-1-1	153	110	11	6.12
29	BRBa73-62-1-1-1	139	112	13	7.46
30	BRBa73-62-3-1-2	153	113	14	6.63
31	BRBa73-62-5-1-4	153	111	10	7.22
32	BRBa73-63-6-1-1	139	95	19	7.82
33	BRBa73-67-1-1-1	153	95	11	6.35
34	BRBa74-6-4-1-1	139	116	11	6.07
35	BRBa74-8-2-1-5	139	107	18	6.15
36	BRBa74-9-5-1-2	139	96	12	8.66
37	BRBa74-58-2-1-1	160	109	12	6.12
38	BRBa75-2-1-1-1	139	104	11	6.48
39	BRBa76-3-4-1-1	148	100	14	7.93
40	BRBa76-4-2-1-1	148	113	17	8.53
41	BRBa76-6-3-1-3	148	103	16	6.52
42	BRBa76-6-3-2-3	139	102	11	8.94
43	BRBa76-7-3-1-1	139	114	11	9.19
44	BRBa76-8-1-2-4	139	122	12	7.42
45	BRBa76-8-3-1-2	139	116	14	6.60
46	BRBa76-8-4-1-3	148	107	13	7.68
47	BRBa76-8-4-2-3	148	113	9	7.85
48	BRBa76-9-1-1-4	139	101	9	6.69
49	BRBa76-9-2-1-1	139	119	15	6.58
50	BRBa76-9-2-2-1	148	112	12	7.24
51	BRBa76-10-2-1-1	148	103	10	7.31
52	BRBa76-10-3-2-1	148	100	14	6.10
53	BRBa76-10-3-2-3	139	106	14	7.84
54	BRBa76-10-3-3-1	148	103	13	7.75
55	BRBa76-10-3-3-2	139	98	12	7.69
56	BRBa76-10-3-3-3	148	106	13	7.23
57	BRBa76-11-2-1-1	148	115	10	6.39

Sl	Designation	GD (days)	PH (cm)	ET (no.)	Yield(t/ha)
58	BRBa76-11-2-2-2	148	105	10	7.75
59	BRBa76-11-3-2-1	148	105	14	7.82
60	BRBa76-11-4-2-1	148	99	12	6.15
61	BRBa76-15-1-2-3	153	111	16	6.13
62	BRBa76-15-2-2-1	153	121	14	6.57
63	BRBa76-16-2-1-1	153	114	13	6.66
64	BRBa76-17-1-1-1	139	122	14	6.32
65	BRBa76-18-1-1-3	153	123	17	6.10
66	BRBa76-18-2-1-1	148	125	13	6.81
67	BRBa76-19-B-1-2	148	122	11	6.65
68	BRBa77-1-2-1-1	148	116	11	6.40
69	BRBa77-2-2-1-2	139	107	13	6.47
70	BRBa77-5-3-2-1	148	114	12	7.52
71	BRBa77-5-4-1-1	153	112	18	7.03
72	BRBa77-9-2-1-1	139	117	13	8.13
73	BRBa77-10-1-2-2	153	119	18	6.56
74	BRBa77-10-1-2-3	139	110	11	6.79
75	BRBa77-10-6-1-1	139	123	13	7.50
76	BRBa77-13-2-3-1	148	124	14	7.25
77	BRBa77-13-2-4-1	148	122	12	7.77
78	BRBa77-13-2-4-2	148	100	15	6.77
79	BRBa77-15-3-1-3	139	126	17	6.51
80	BRBa77-19-2-1-1	148	121	17	6.38
81	BRBa77-24-2-1-4	139	126	10	6.63
82	BRBa77-25-2-1-1	148	102	11	8.69
83	BRBa77-27-1-1-2	148	115	12	7.51
84	BRBa77-27-6-1-10	139	121	12	6.44
85	BRBa77-27-6-1-11	139	111	18	8.93
86	BRBa113-16-3	139	102	11	7.47
87	BRBa113-17-1	139	104	11	7.60
88	BRBa115-1-2	148	116	16	6.70
Ck	BRRI dhan74	139	93	12	5.00
Ck	BRRI dhan89	150	104	12	5.31
Ck	BRRI dhan101	139	107	9	5.50
Ck	BRRI dhan102	144	102	13	4.68
	CV (%)	**4.28**	**7.68**	**18.99**	**12.09**
	Lsd (0.05)	**17.66**	**24.02**	**6.78**	**2.35**

D/S- 14/12/23 **D/T- 20/01/24**

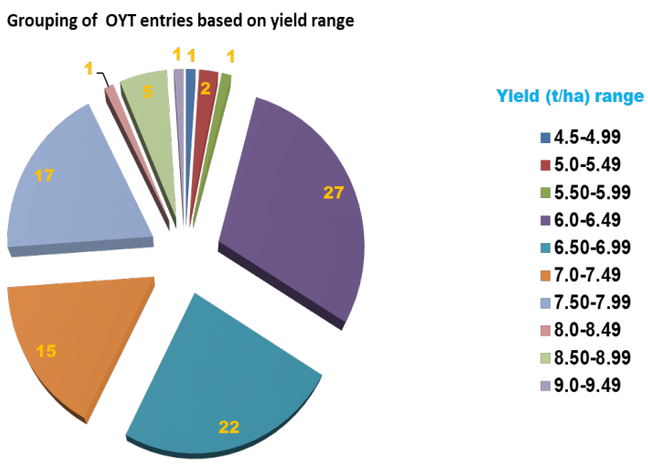


Figure 2. Performance of selected genotypes in OYT#1, Boro 2023-24

Expt. 4.1.2 Observational Yield Trial (OYT# 2), Boro 2023-24

Objective: The study was conducted to select suitable fixed lines for Boro season with dense and erect panicle, strong culm, high yield potential and disease as well as insect resistant at field conditions for further evaluation in the preliminary yield trial nursery (PYT).

Materials and methods: A total of 77 entries along with four checks (BRRI dhan74, BRRI dhan89 and BRRI hybrid dhan8) were grown following augmented design (Table 13). Single seedling of 40 days old was transplanted in 5.4 m x 1 m plots at a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg urea, triple super phosphate, muriate of potash, gypsum and zinc sulphate/ha, respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full doses of TSP, MoP, gypsum and zinc sulphate were applied during final land preparation. Other cultural practices were done as and when necessary.

Results: Based on phenotypic acceptability (4-5) and grain yield performance twenty-five genotypes were selected for further evaluation. Selected genotypes were found out yielded (5.11-.33.33%) over the second highest check variety BRRI dhan89 (7.20t/ha) whereas only fifteen genotypes showed better yield performance over the highest yielded check BRRI hybrid dhandhan8 (8.40t/ha). The genotype H1340-4-3-1-2-B gave the highest yield (9.61t/ha) with a growth duration of 148 days which is similar to the highest yielded check variety BRRI hybrid dhan8.

Table 13. Yield and ancillary characters of selected OYT#2 materials, Boro 2023-24.

Sl	Designation	GD (days)	PH (cm)	ET (no.)	Yield(t/ha)
1	H1278-1-1-4-2-B	153	119	7	8.59
2	H1279-2-1-2-2-B	148	130	7	8.63
3	H1280-3-2-2-3-B	148	110	7	8.54
4	H1284-1-1-1-2-B	153	121	9	8.21
5	H1286-3-5-1-3-B	148	107	9	7.57
6	H1291-1-3-1-3-B	148	98	7	8.90
7	H1293-1-2-1-1-B	158	110	10	7.96
8	H1297-2-4-1-2-B	148	103	7	8.36
9	H1298-1-2-2-4-B	148	105	7	8.38
10	H1310-1-3-1-2-B	153	108	6	8.77
11	H1310-3-5-1-3-B	148	120	10	8.02
12	H1318-1-2-1-5-B	148	107	9	8.02
13	H1322-4-3-1-1-B	153	106	9	8.22
14	H1323-1-1-2-1-B	148	109	6	8.47
15	H1323-4-1-1-3-B	153	116	12	8.23
16	H1326-2-4-2-3-B	153	112	7	8.50
17	H1326-14-2-2-3-B	153	112	7	8.44
18	H1327-11-2-1-3-B	148	116	10	8.92
19	H1329-11-6-2-5-B	148	115	8	8.54
20	H1330-3-2-1-2-B	158	122	8	8.83
21	H1332-7-2-1-3-B	148	117	13	9.20
22	H1334-9-3-1-1-B	148	111	6	9.11
23	H1335-3-1-2-2-B	148	110	7	8.46
24	H1338-2-4-1-1-B	148	123	11	7.84
25	H1340-4-3-1-2-B	148	119	9	9.61
26	BRRI dhan74	140	98	10	6.59
27	BRRI dhan89	148	106	10	7.20
28	BRRI Hybrid dhan8	148	104	8	8.40
	CV (%)	**2.38**	**6.96**	**21.19**	**7.34**
	LSD (0.05)	**10.34**	**22.64**	**5.17**	**1.79**

D/S- 14/12/23 **D/T- 23/01/24**

Expt. 4.1.3 Observational Yield Trial (OYT#FBC), Boro 2023-24

Objective: The study was conducted to select suitable fixed lines for Boro season with dense and erect panicle, strong culm, high yield potential and disease as well as insect resistance at field condition for further evaluation in the preliminary yield trial nursery (PYT).

Materials and methods: A total of 296 entries along with six checks, BRRI dhan28, BRRI dhan29, BRRI dhan88, BRRI dhan89, BRRI dhan92 and BRRI dhan100 were grown following row column design (Table 14). Single seedling of 36 days old was transplanted in 5.4 m x 1 m plots at a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg urea, triple super phosphate, muriate of potash, gypsum and zinc sulphate/ha, respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full doses of TSP, MoP, gypsum and zinc sulphate were applied during final land preparation. Other cultural practices were done as and when necessary.

Results: The growth duration of tested entries were found 129-148 days whereas 130-148 days found in the check varieties. The yield range was observed 1.98-8.28t/ha among the tested entries and 5.47-7.01t/ha were found in the checks. The entry BR14007-2R-47 gave the highest yield (8.28 t/ha) entry with a similar growth duration of the highest yielded check variety BRRI dhan29 (7.01 t/ha; 143 days).

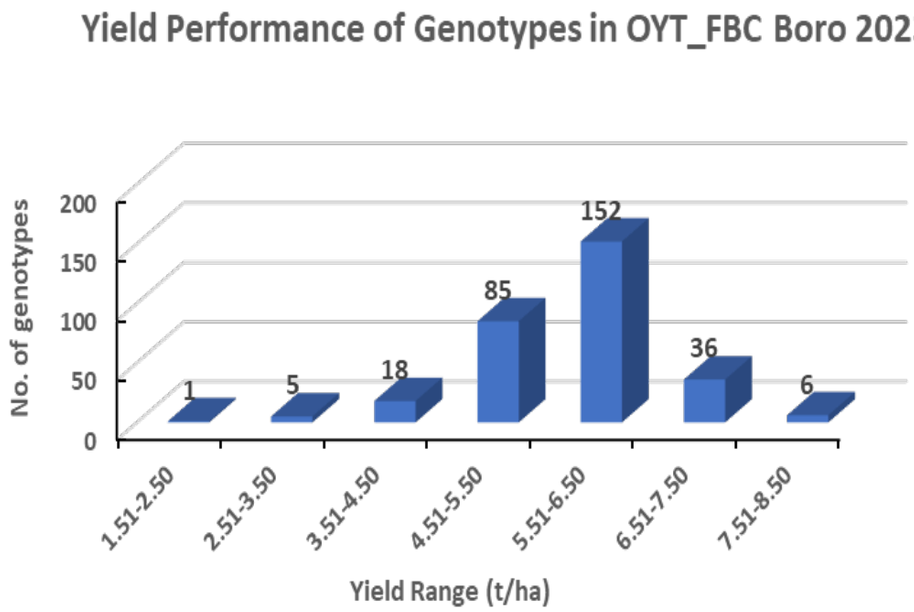


Figure 3. Yield range of tested OYT#FBC materials, Boro 2023-24.

D/S- 23/12/23 **D/T- 29/01/24**

Expt.4.2.1. Preliminary Yield Trial (PYT) during T Aman 2023

Objectives: The preliminary yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: A total of sixteen advanced breeding lines along with four checks, BRRI dhan23, BRRI dhan52, BRRI dhan76, and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2 m following the RCB design with three replications. Forty days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the

time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), 1000-grain weight (gm) and grain yield (t/ha).

Results: Among the tested materials growth duration was ranged from 128 to 157days.The shortest plant height was observed in BRBa30-5-2-1-1 (111cm) while longest plant height was found in BRBa29-5-4-2-1 (157cm). The effective number of tillers was ranged from 7to 9. Six entries were selected comparing with better yielding check variety BRRI dhan87 (3.96/ha). The yield range of the tested entries was 2.79 to 4.24 t/ha. Highest yield was obtained from BRBa30-3-4-2-2 (4.24t/ha) followed by BRBa30-3-4-1-1-P2 (4.19t/ha) and BRBa31-1-2-1-1 (4.13t/ha) and lowest yield was obtained from BRBa29-5-4-2-1 (2.79 t/ha). Due to natural calamities like high tide effect during maximum tillering stage and Midhili prior to harvesting period caused lower yield of the advanced lines. Noted that the selected four entries will be tested again in T. Aman 2024.

Table 15: Yield and ancillary characters of selected PYT materials, T. Aman 2023

Sl	Designation	GD (days)	SH (cm)	PH (cm)	ET/hill (no.)	Yield (t/ha)
1	BRBa22-1-2-2-2	134	65	116	8	3.56
2	BRBa22-5-B-2-1	134	62	114	9	3.57
3	BRBa22-7-2-1-4	135	66	119	8	3.61
4	BRBa27-1-3-1-3	133	67	115	7	3.04
5	BRBa29-5-4-2-1	136	88	157	7	2.79
6	BRBa29-5-B-2-2	134	70	117	9	3.85
7	BRBa30-1-3-2-3	134	60	134	9	4.11
8	BRBa30-3-4-1-1-P2	129	66	127	9	4.19
9	BRBa30-3-4-2-2	128	56	133	8	4.24
10	BRBa30-5-2-1-1	128	57	111	9	3.89
11	BRBa30-6-7-2-2	134	67	127	8	3.97
12	BRBa30-6-B-4-3	129	66	123	8	4.02
13	BRBa31-1-2-1-1	135	73	126	8	4.13
14	BRBa31-2-1-1-1	129	64	124	8	3.82
15	BRBa32-1-1-1-1	128	52	114	8	3.60
16	BRBa34-2-2-5-2	132	63	118	8	3.64
Ck	BR23	150	49	117	7	3.54
Ck	BRRI dhan52	134	55	114	8	3.25
Ck	BRRI dhan76	157	79	149	8	3.30
Ck	BRRI dhan87	129	64	117	8	3.96
	CV(%)	**4.6**	**-**	**7.3**	**12.7**	**6.02**
	Lsd(0.05)	**4.1**	**-**	**13.5**	**2.8**	**0.58**
	D/S- 11.07.23				**D/T- 11.08.23**	

Expt. 4.2.2: Preliminary Yield Trial (PYT) during Boro 2023-24

Objective: The preliminary yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: A total of eight advanced breeding lines along with three checks, BRRI dhan74, BRRI dhan101 and BRRI dhan102 were grown at BRRI Charbadna farm, Barishal in 2023-24. The unit plot size was 5.4 m x 1 m. The experiment was laid out in RCB design with three replications. 38 days old seedlings of each genotype were transplanted with a spacing of 20 cm x 20 cm. Fertilizers were applied @ 260:100:120:110:10 kg/ha urea, triple super phosphate, muriate of potash, gypsum and zinc sulphate, respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full dose of TSP, MoP, gypsum and zinc sulphate at final land preparation. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height, tiller/hill, panicle/hill, panicle length, fertility (%), 1000-grain weight and grain yield.

Results: Among the tested materials, BRBa72-17-2-1-1-1 (7.30t/ha) and BRBa71-1-2-1-2-4-1(7.3t/ha) gave similar yield with the highest yielded check BRRI dhan102 (7.30t/ha). The yield range was 6.2-7.3t/ha found in the tested entries where as 6.8-7.3t/ha was found in the checks. The gowth duration range of the tested entries was 140-141 days whereas it was found 145 days in checks. The plant height varied in the tested entries was 96-113 cm whereas it was 107cm for BRRI dhan101(Table 16).

Table 16. Yield and ancillary characters of selected genotypes of PYT, Boro 2023-24

Sl	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BRBa53-13-1-3-2-2-2	141	112	8	6.41
2	BRBa55-1-2-3-3-2-B2	140	113	7	6.22
3	BRBa71-1-2-1-2-4-1	140	104	9	7.33
4	BRBa71-5-1-2-2-2	140	96	7	6.63
5	BRBa72-14-1-2-1-1	140	99	7	7.10
6	BRBa72-16-2-2-3-2	140	100	8	7.01
7	BRBa72-17-2-1-1-1	140	98	8	7.30
8	BRBa72-17-2-1-1-3	140	99	8	7.08
Ck	BRRI dhan74	145	96	9	6.80
Ck	BRRI dhan101	145	107	8	6.98
Ck	BRRI dhan102	145	100	9	7.30
	CV (%)	**1.15**	**5.24**	**11.58**	**6.87**
	Lsd (0.05)	**2.70**	**8.92**	**1.56**	**0.79**

D/S- 08.12.24 **D/T- 15.01.24**

Expt.4.3.1. Advanced Yield Trial (AYT#4) under non-saline tidal condition during T Aus 2023

Objectives: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: A total Eight entries along with four checks BR27, BRRI dhan98, BRRI dhan106 and Gota IRRI were grown at two locations such as Charbadna farm, BRRI, Barishal and Karnakathi of Barishal sadar. during T. Aus 2023. The unit plot size was 5.4 m x 1 m following RCB design with three replications. Twenty-two days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25 cm x 15 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), 1000-grain weight (gm) and grain yield (t/ha).

Results: Growth duration of the tested entries was ranged from 112 days to 120 days at Charbadna farm whereas it was found 101 days to 108 days at Karnakathi. One entry BR12614-4R-158 gave higher yield (5.35t/ha) over the highest yielded check BBRI dhan98 (5.29 t/ha) with a growth duration of 120 days which is 8 days longer than the highest yielded check at Charbadna firm and none of the entries was selected in karnakathi**.**

Table 17: Yield and ancillary characters of selected AYT#4 materials, T. Aus 2023 at Charbadna, BRRI Barishal

Entry	Designation	GD(Days)	SH (cm)	PH (cm)	ET(No)	GY (t/ha.)
1	BR8773-2-2-2-2	112	31	118	7	3.89
2	BR10969-B-3R-23	112	30	110	8	4.50
3	BR11848-4R-104	112	33	136	8	4.74
4	BR11868-5R-2	115	28	120	8	4.97
5	BR12096-4R-127	112	29	107	6	5.02

Entry	Designation	GD(Days)	SH (cm)	PH (cm)	ET(No)	GY (t/ha.)
6	BR12603-4R-166	112	27	130	8	4.33
7	BR12614-4R-134	120	33	128	8	4.85
8	BR12614-4R-158	120	31	121	9	5.35
9	BRRI dhan106	120	30	120	8	4.43
10	BRRI dhan27	112	30	138	7	4.04
11	BRRI dhan98	112	26	103	10	5.29
12	Gota IRRI	120	30	116	9	4.82
	CV(%)	**2.93**	**8.25**	**12.47**	**10.28**	**2.93**
	Lsd(0.05)	**6.97**	**20.74**	**2.10**	**0.99**	**6.97**
	D/S- 18.04.23				**D/T- 10.05.23**	

Table 18: Yield and ancillary characters of selected AYT#4 materials, T. Aus 2023 at Karnakathi, Barishal

Entry	Designation	GD(Days)	SH (cm)	PH (cm)	ET(No)	GY (t/ha)
1	BR8773-2-2-2-2	107	31	124	7	4.59
2	BR10969-B-3R-23	103	30	117	7	4.73
3	BR11848-4R-104	101	33	144	6	3.55
4	BR11868-5R-2	104	28	115	7	3.95
5	BR12096-4R-127	105	29	109	8	4.73
6	BR12603-4R-166	108	27	140	7	3.95
7	BR12614-4R-134	104	33	123	8	3.68
8	BR12614-4R-158	103	31	118	9	2.40
9	BRRI dhan106	117	30	116	7	4.09
10	BRRI dhan27	105	30	150	7	3.89
11	BRRI dhan98	101	26	97	10	4.75
12	Gota IRRI		Lack of seedlings			
	CV(%)	**4.24**	**12.02**	**14.14**	**18.39**	**4.24**
	Lsd(0.05)	**9.30**	**30.86**	**2.31**	**1.55**	**9.30**
	D/S- 18.04.23				**D/T- 10.05.23**	

Expt.4.3.2. Advanced Yield Trial (AYT#1) during T Aman 2023

Objectives: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: A total of twelve entries along with five checks BR23, BRRI dhan52, BRRI dhan72, BRRI dhan76and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2 m following RCB design with three replications. Forty days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), 1000-grain weight (gm) and grain yield (t/ha).

Results: The growth duration of the tested entries was ranged from 131 days to 136 days. Four entries gave higher yield over the highest yielded check BBRI dhan72 (4.20 t/ha). Natural calamities like high tide effect during the maximum tillering stage and cyclone Midhili prior to harvesting period causing lower yield of the advanced lines. Noted that the experiment will be tested again in T. Aman 2024.

Table 19: Yield and ancillary characters of selected AYT#1 materials, T. Aman 2023

Sl	Designation	GD (days)	SH (cm)	PH (cm)	ET/hill (no.)	Yield (t/ha)
1	BRBa21-7-1-1-3	131	88	153	7	2.68
2	BRBa21-9-3-1-1	136	71	163	8	2.74
3	BRBa23-4-2-1-1-P2	134	59	111	8	3.77
4	BRBa23-4-3-1-1-P1	132	67	128	8	2.89
5	BRBa23-4-3-1-1-P2	131	71	125	8	3.01
6	BRBa23-6-2-2-4-P1	131	52	104	8	3.01
7	BRBa23-15-3-3-3-P1	136	76	143	7	3.12
8	BRBa26-1-1-1-1	131	65	112	6	4.20
9	BRBa26-1-1-1-2	131	62	109	7	4.99
10	BRBa26-1-1-2-3	132	59	108	7	4.42
11	BRBa26-1-1-2-4	131	72	106	7	4.50
12	BRBa26-1-1-2-6	131	60	110	7	4.01
Ck	BR23	149	67	112	7	3.74
Ck	BRRI dhan52	134	46	115	6	3.63
Ck	BRRI dhan72	131	63	108	6	4.20
Ck	BRRI dhan76	156	81	143	7	3.45
Ck	BRRI dhan87	128	61	119	7	3.71
	CV(%)	**4.63**	**-**	**7.48**	**11.07**	**8.74**
	lsd(0.05)	**2.29**	**-**	**6.97**	**2.36**	**0.47**
	D/S- 12.07.23				**D/T- 21.08.23**	

Expt.4.3.3. Advanced Yield Trial (AYT#2) during T Aman 2023

Objectives: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: A total of twenty entries along with four checks BR23, BRRI dhan52, BRRI dhan76 and BRRI dhan77 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 1.6 m following the RCB design with three replications. Thirty-nine days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), 1000-grain weight (gm) and grain yield (t/ha).

Results: The growth duration of the tested entries was ranged from 130 days to 137 days. Only one entry BRba11-33-1-5-1 found out-yielded (3.81 t/ha) over the highest yielded check BR23 (3.71t/ha). Due to natural calamities like high tide effect during maximum tillering stage and cyclone Midhili prior to harvesting period caused lower yield of the advanced lines. Noted that the experiment will be retested in T. Aman 2024.

Table 20: Yield and ancillary characters of selected AYT#2 materials, T. Aman 2023

Sl	Designation	GD (days)	SH (cm)	PH (cm)	ET/hill (no.)	Yield (t/ha)
1	BRBa11-1-1-3-2	132	90	161	7	2.88
2	BRBa11-5-1-1-3	134	70	146	7	2.79
3	BRBa11-26-3-2-2	132	91	140	7	3.42
4	BRBa-11-30-1-1-1	132	89	146	7	3.30
5	BRBa11-33-1-5-1	132	84	155	6	3.81
6	BRBa11-45-3-2-2	131	78	158	6	3.42
7	BRBa11-47-1-3-2	131	76	141	6	2.89
8	BRBa11-48-1-2-1	134	75	144	7	3.28

Sl	Designation	GD (days)	SH (cm)	PH (cm)	ET/hill (no.)	Yield (t/ha)
9	BRBa11-77-1-2-3	133	78	155	6	2.35
10	BRBa12-19-2-2-4	131	64	117	8	3.23
11	BRBa12-19-4-6-2	134	56	120	8	3.00
12	BRBa12-33-2-3-2	133	59	115	6	3.44
13	BRBa12-37-2-1-5	131	52	124	7	3.03
14	BRBa12-41-1-2-1	130	54	112	8	3.36
15	BRBa13-47-2-4-1	133	52	124	6	3.08
16	BRBa13-49-1-5-2	137	76	135	7	2.85
17	BRBa16-26-2-3-6	133	54	123	6	2.92
18	BRBa17-26-1-4-1	131	71	143	7	3.17
19	BRBa17-28-4-1-2	131	78	155	5	3.07
20	BRBa19-48-1-2-2	133	77	148	6	3.18
21	BR23	148	52	116	6	3.71
22	BRRI dhan52	135	56	110	7	3.69
23	BRRI dhan76	156	72	142	7	3.42
24	BRRI dhan77	146	74	144	6	3.52
	CV	**1.26**	**-**	**3.97**	**13.74**	**4.71**
	LSD (0.05)	**5.36**	**-**	**17.07**	**2.24**	**0.47**

D/S- 13.07.23 **D/T- 21.08.23**

Expt.4.3.4. Advanced Yield Trial (AYT#3) during T Aman 2023

Objectives: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: Sixteen entries along with five checks BR23, BRRI dhan52, BRRI dhan72, BRRI dhan76 and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 1.4 m following RCB design with three replications. Thirty-two days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), 1000-grain weight (gm) and grain yield (t/ha).

Results: The growth duration of the tested entries was ranged from 130 days to 135 days. None of the tested entries were found out-yielded over the check varieties. The yield range of the tested entries found 3.04-3.93 t/ha and the yield range of 3.38-4.24 t/ha was found in the check varieties.

Table 21: Yield and ancillary characters of selected AYT#3 materials, T. Aman 2023

Sl	Designation	GD (days)	SH (cm)	PH (cm)	ET(No.)	GY(t/ha)
1	SV0422	130	56	101	8	3.43
2	SV0802	130	56	101	9	3.36
3	SV0057	130	42	102	8	3.38
4	SV0058	130	50	101	8	3.32
5	SV0061	131	49	107	9	3.76
6	SV0665	130	38	84	8	3.21
7	SV0755	130	57	95	8	3.04
8	SV0769	134	54	107	9	3.35
9	SV0775	132	51	98	10	3.53
10	SV0202	130	53	100	9	3.70
11	SV0019	130	39	102	8	3.49

Sl	Designation	GD (days)	SH (cm)	PH (cm)	ET(No.)	GY(t/ha)
12	SV0609	130	40	101	10	3.13
13	SV0011	130	50	113	8	3.24
14	SV0025	130	53	115	10	3.46
15	SV0163	135	49	103	7	3.48
16	SV1104	135	45	98	9	3.93
Ck	BR23	150	67	120	8	3.68
Ck	BRRI dhan52	132	49	113	8	3.58
Ck	BRRI dhan72	132	60	110	7	4.24
Ck	BRRI dhan76	155	76	146	7	3.38
Ck	BRRI dhan87	129	63	116	7	3.77
	CV(%)	**4.18**	**-**	**13.61**	**7.22**	**4.43**
	lsd(0.05)	**8.22**	**-**	**2.30**	**0.52**	**0.41**
	D/S- 14.07.23				**D/T- 16.08.23**	

Tidal Scenario during T. aman 2023 at Charbadna farm of BRRI, RS, Barishal

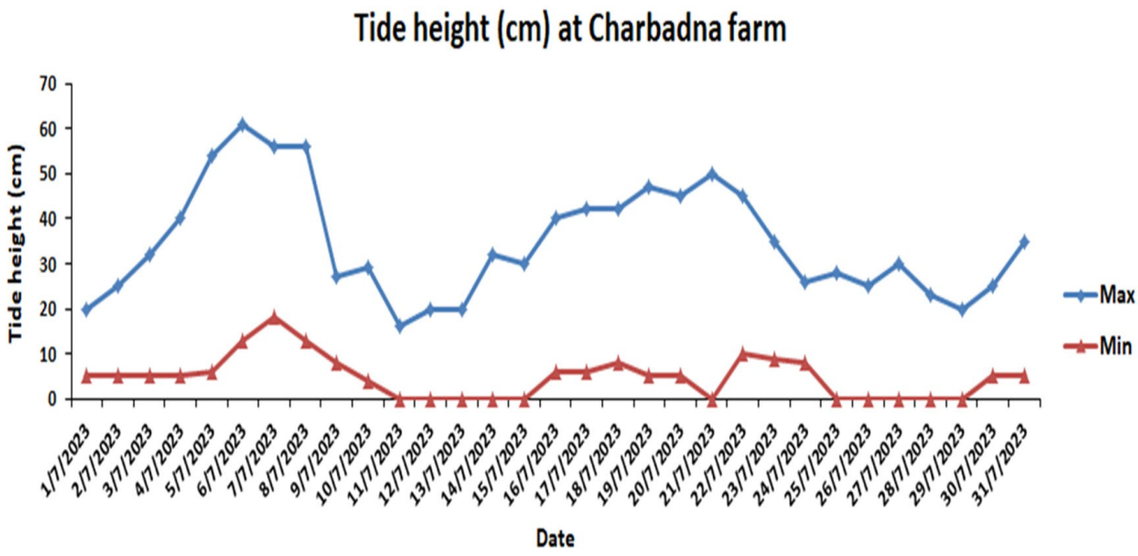


Figure 4. 1st spell of high tide from 6-8th July, 2023

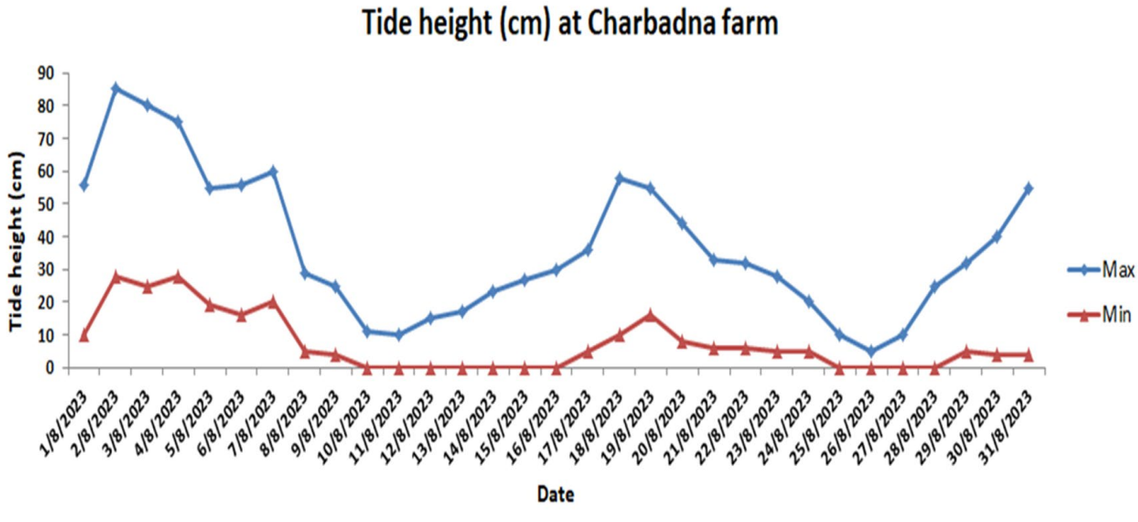


Figure 5. 2nd spell of high tide from 1-4th August, 2023

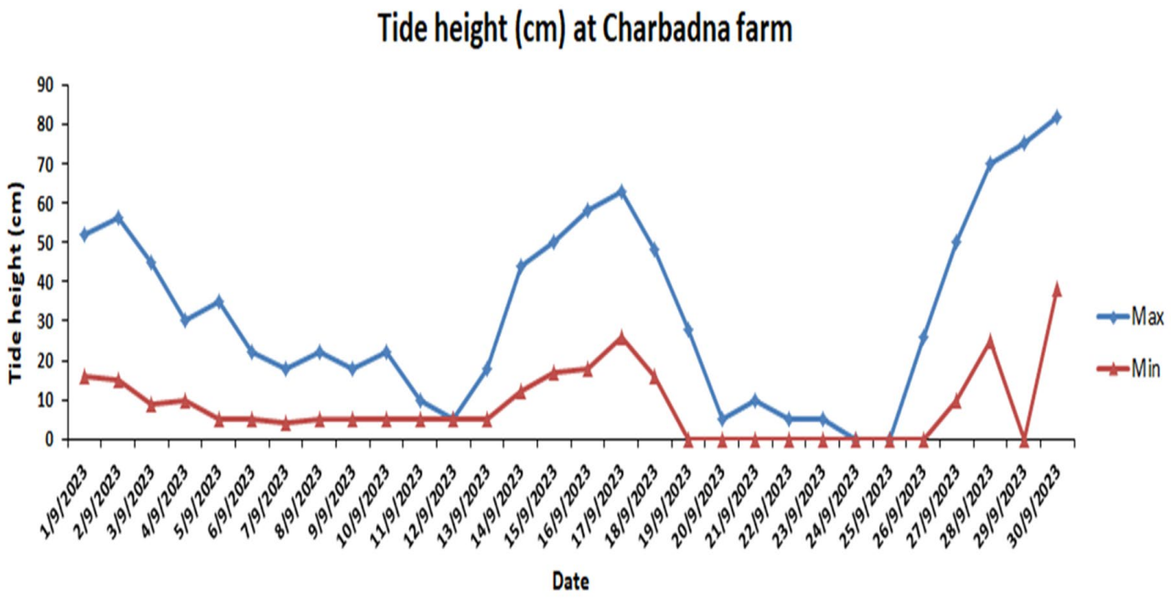


Figure 6. 3rd spell of high tide from 28-30th September, 2023

Figure 8. Pictorial View of the Research fields at Charbadna Farm after high tide.

Figure 9. Pictorial View of the Research fields at Sagardi Farm after high tide.

Figure 10. Cyclone Midhili effects at Charbadna Farm.

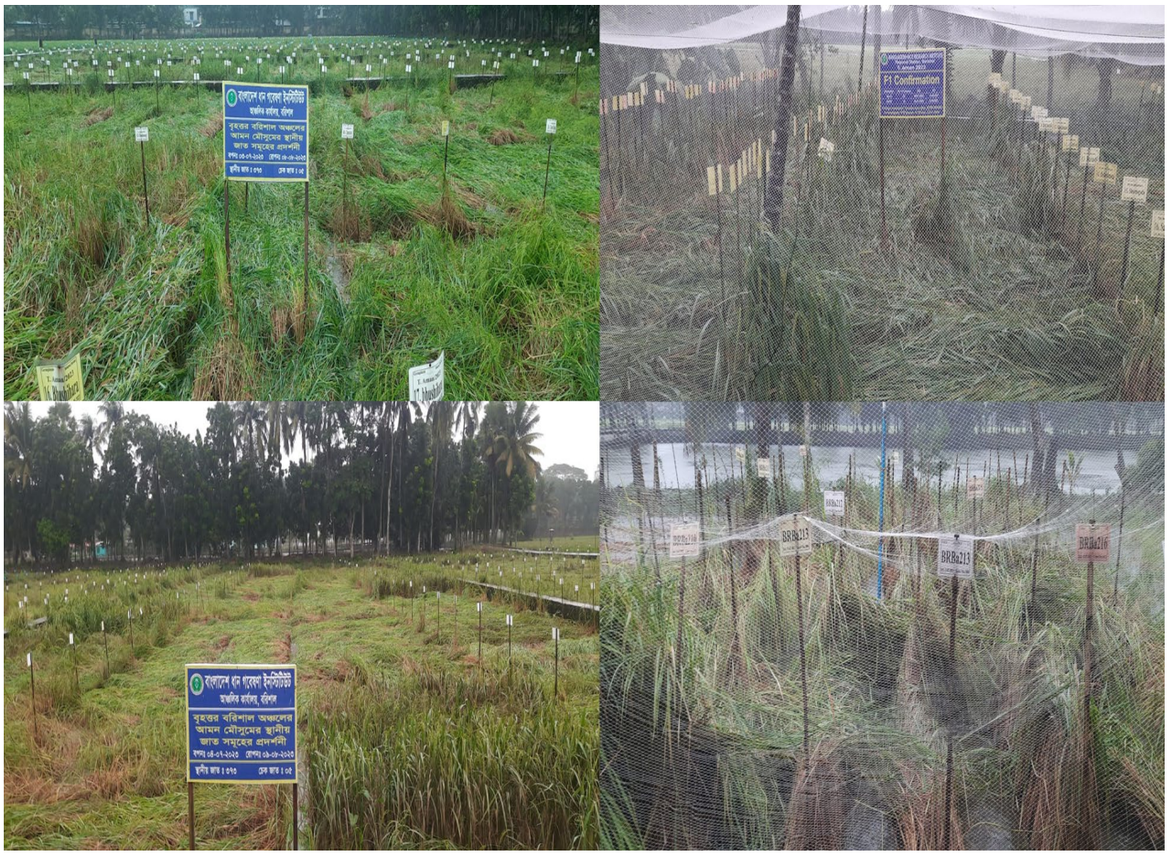


Figure 11. Cyclone Midhili effects at Sagardi Farm

Expt.4.3.5: Advanced Yield Trial (AYT#1) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of ten entries along with two checks BRRI dhan74, and BRRIdhan89 were grown at Sagordi farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 rows following RCBD design with three replications. Thirty-four days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses

were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The growth duration of the tested materials was ranged from 139 to 144 days whereas the growth duration of the check varieties ranged from 138 (BRRI dhan74) to 146 days (BRRI dhan89). The plant height of the tested entries was varied from 107 to 116cm. The effective tiller of the tested entries varied from 8 to 10 The yield range was 5.17t/ha (NGR 1203-1) to 6.32t/ha(NGR 1210-2). None of the tested entries were found to be outyielded over the check varieties (Table 22).

Table 22: Yield and ancillary characters of selected AYT#1 genotypes, Boro 2023-24.

Entry	Designation	GD (Days)	PH (cm)	ET (No.)	Yield (t/ha)
1	NGR 837-1	139	110	9	5.77
2	NGR 1210-1	139	115	8	5.8
3	NGR 1210-2	140	116	9	6.32
4	NGR 1203-1	140	111	9	5.17
5	NGR 1203-2	141	107	9	5.78
6	NGR 1203-3	143	110	8	5.55
7	NGR 1230-1	144	111	9	5.71
8	NGR 1394-1	140	110	10	5.83
9	NGR 1394-2	141	110	9	5.75
10	NGR 1394-3	143	112	8	6.14
Ck	BRRI dhan74	138	98	10	6.02
Ck	BRRI dhan89	146	106	10	6.51
	CV (%)	**1.71**	**3.22**	**11.48**	**7.45**
	Lsd (0.05)	**4.01**	**5.86**	**1.73**	**0.73**

D/S- 06.12.23 **D/T- 10.01.24**

Expt.4.3.6: Advanced Yield Trial (AYT#2) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of fourteen entries along with two checks BRRI dhan74, and BRRIdhan89 were grown at Sagardi farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 rows following RCBD design with three replications. Thirty-five days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The growth duration of the tested materials was ranged from 137 to 144 days whereas the growth duration of the check varieties ranged from 137 (BRRI dhan74) to 146 days (BRRI dhan89). The plant height of the tested entries was varied from 103 to 112cm. The effective tiller

of the tested entries was varied from 12 to 16. The yield range was 5.17t/ha (NGR 314-2) to 6.58t/ha (NGR 223-2, NGR 324-1). Four entries found out-yielded over the highest yielded check variety (BRRI dhan89, 6.46t/ha) with a yield advantage of 1.53-1.86%. (Table 23).

Table 23: Yield and ancillary characters of selected AYT#2 genotypes, Boro 2023-24.

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	NGR 178-1	137	106	12	6.56
2	NGR 219-2	141	107	12	5.57
3	NGR 223-2	139	107	13	6.58
4	NGR 225-1	143	107	12	6.57
5	NGR 314-2	143	104	14	5.17
6	NGR 324-1	140	103	16	6.58
7	NGR 325-1	137	106	13	6.4
8	NGR 398-1	139	107	13	6.36
9	NGR 413-1	138	107	13	5.65
10	NGR 417-2	142	107	12	5.88
11	NGR 419-2	141	106	12	5.26
12	NGR 464-2	144	112	15	5.6
13	NGR 478-2	142	109	13	5.23
14	NGR 524-2	138	103	12	5.65
Ck	BRRI dhan74	137	97	11	6.39
Ck	BRRI dhan89	146	107	12	6.46
	CV (%)	**2.17**	**3.4**	**11.72**	**10.31**
	Lsd (0.05)	**5**	**5.91**	**2.46**	**1.02**
	D/S- 06.12.23				**D/S- 10.01.24**

Expt.4.3.7: Advanced Yield Trial (AYT#3) for favorable Boro during Boro 2022-23

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of fourteen entries along with two checks BRRI dhan74, and BRRIdhan89 were grown at Sagardi farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 rows following RCBD design with three replications. Thirty-seven days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: Among the tested entries, NGR 1254-1 (6.71/ha), NGR 1256-1 (6.67 t/ha), and NGR 1148-1 (6.63/ha) gave a higher yield than the highest yielded check BRRI dhan89(6.51/ha). The growth duration of tested entries was ranged from 134 to 143 days whereas in BRRI dhan89it was 146 days. Plant height range of the tested entries was 107 to 113cm whereas, in BRRI dhan89 it was107cm (Table 24).

Table 24: Yield and ancillary characters of selected AYT #3 genotypes, Boro 2023-24.

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	NGR 525-1	138	110	14	6.19
2	NGR 560-2	138	108	13	5.84
3	NGR 593-2	139	111	13	6.2
4	NGR 721-1	140	110	13	6.16

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
5	NGR 736-3	143	109	14	5.37
6	NGR 903-1	137	109	13	5.95
7	NGR 1025-1	141	113	9	5.81
8	NGR 1148-1	140	108	11	6.63
9	NGR 1254-1	140	111	12	6.71
10	NGR 1256-1	134	107	13	6.67
11	NGR 1258-1	140	109	11	5.6
12	NGR 1392-4	139	111	9	5.52
13	NGR 991-1	143	111	11	5.92
14	NGR 991-3	141	111	11	5.41
Ck	BRRI dhan74	138	98	11	6.24
Ck	BRRI dhan89	146	107	12	6.57
	CV (%)	**1.87**	**3.05**	**12.11**	**9.01**
	Lsd (0.05)	**4.3**	**5.46**	**2.36**	**0.89**
	D/S- 08.12.23			**D/T- 14.01.24**	

Expt.4.3.8: Advanced Yield Trial (AYT#4) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of fourteen entries along with two checks BRRI dhan74, and BRRIdhan89 were grown at Charbadna farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 m following RCBD design with three replications. Thirty-seven days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The yield range of the tested entries was found 5.32-7.13t/ha. The yield range of the check varieties was found 6.42t/ha (BRRI dhan89) to 7.26t/ha (BRRI dhan74). None of the tested entries found out yielded over the check varieties. Growth duration of the tested entries ranged from 138 to 143 days whereas, in BRRI dhan74it was 138 days. The plant height range of the tested entries was 103 to 119cm whereas, in BRRI dhan74it was 100 cm. The range of the effective tiller number of the tested entries was 9-15 (Table 25).

Table 25: Yield and ancillary characters of selected AYT#4 genotypes, Boro 2023-24

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	NGR 416-2	140	107	12	6.35
2	NGR 416-3	138	109	12	7.13
3	NGR 219-2	143	117	12	5.32
4	NGR 314-1	143	119	12	6.02
5	NGR 417-1	140	107	12	6.25
6	NGR 1256-2	138	103	12	6.9
7	NGR 528-2	139	107	13	5.72
8	NGR 776-1	140	105	12	6.8
9	NGR 902-1	138	108	13	6.34
10	NGR 560-1	140	113	9	5.87
11	NGR 566-1	139	116	12	5.78

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
12	NGR 592-1	138	107	15	5.94
13	NGR 593-1	139	107	13	5.99
14	NGR 1258-2	137	110	13	6.35
Ck	BRRI dhan74	138	100	11	7.26
Ck	BRRI dhan89	146	108	12	6.42
	CV (%)	**1.71**	**4.59**	**10.4**	**9.85**
	Lsd (0.05)	**3.92**	**8.21**	**2.07**	**1.02**
	D/S- 08.12.23				**D/T- 14.01.24**

Expt.4.3.9: Advanced Yield Trial (AYT#5) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of fourteen entries along with two checks BRRI dhan74, and BRRIdhan89 were grown at Charbadna farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 m following RCBD design with three replications. Thirty-seven days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The growth duration of the tested materials was ranged from 136 to 142 days whereas the growth duration of the check varieties ranged from 137 (BRRI dhan74) to 148 days (BRRI dhan89). The plant height of the tested entries was varied from 107 to 113cm. The effective tiller of the tested entries was varied from 11 to 14. The yield range was 5.39t/ha (NGR 857-2) to 6.99t/ha (NGR 1258-3). None of the tested entries were found to be outyielded over the check varieties where only one tested entry that is NGR 1258-3 gave a similar yield to the highest yielded check variety BRRI dhan74(6.99t/ha) with a growth duration of 140 days (Table 26).

Table 26: Yield and ancillary characters of selected AYT #5 genotypes, Boro 2023-24.

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	NGR 1258-3	140	109	13	6.99
2	NGR 225-2	139	107	13	6.43
3	NGR 857-2	138	113	13	5.39
4	NGR 991-2	138	110	13	6.5
5	NGR 696-1	140	108	11	5.81
6	NGR 528-1	139	111	11	5.52
7	NGR 1210-3	142	112	12	6.08
8	NGR 223-2	138	109	13	5.99
9	NGR 566-2	138	112	12	6.03
10	NGR 710-2	142	111	12	5.79
11	NGR 521-1	136	109	13	6.26
12	NGR 521-2	137	109	12	6.04
13	NGR 522-1	142	111	13	6.29
14	NGR 418-1	138	111	14	5.99
Ck	BRRI dhan74	137	98	10	6.99
Ck	BRRI dhan89	148	109	11	6.47
	CV (%)	**2.03**	**3.01**	**8.65**	**8.79**

Lsd (0.05)	**4.67**	**5.41**	**1.76**	**0.89**
D/S- 09.12.23			**D/T- 15.01.24**	

Expt.4.3.10: Advanced Yield Trial (AYT#6) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of fourteen entries along with two checks BRRI dhan74, and BRRIdhan89 were grown at Charbadna farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 m following RCBD design with three replications. Thirty-eight days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The growth duration of the tested materials was ranged from 137 to 148 days whereas the growth duration of the check varieties ranged from 137 (BRRI dhan74) to 148 days (BRRI dhan89). The plant height of the tested entries was varied from 106 to 116cm. The effective tiller of the tested entries was varied from 9 to 15The yield range was 5.49t/ha (NGR 416-1) to 6.43t/ha (NGR 1161-3). None of the tested entries found to be outyielded over the check varieties. Highest yield was obtained from the check variety BRRI dhan74 (6.96t/ha) with a growth duration of 137 days (Table 27).

Table 27: Yield and ancillary characters of selected AYT#6 genotypes, Boro 2023-24.

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	NGR 467-2	142	109	15	6.39
2	NGR 1308-2	137	109	13	6.21
3	NGR 1019-2	137	116	9	5.82
4	NGR 1161-2	139	111	12	6.14
5	NGR 1161-3	141	108	14	6.43
6	NGR 522-2	139	110	11	5.97
7	NGR 270-3	140	114	13	5.79
8	NGR 418-1	141	109	13	5.94
9	NGR 416-1	140	109	12	5.49
10	NGR 968-1	140	112	14	5.94
11	NGR 590-2	138	108	13	5.81
12	NGR 710-1	139	106	14	5.99
13	BRBa 1-4-9	147	116	11	5.92
14	BRBa14-NGR 414-1	148	113	14	5.61
Ck	BRRI dhan74	137	98	10	6.96
Ck	BRRI dhan89	148	108	11	6.26
	CV (%)	**2.43**	**4**	**12.14**	**7.9**
	Lsd (0.05)	**5.63**	**7.2**	**2.48**	**0.78**
D/S- 09.12.23				**D/T- 16.01.24**	

Expt.4.3.11: Advanced Yield Trial (AYT#7) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Sagardi farm, Barishal.

Materials and method: A total of fourteen entries along with twochecks BRRI dhan74, and BRRIdhan89 were grown at Charbadna farm, BRRI, Barishal. The unit plot size was 5.4 m x 1.2 m following RCBD design with three replications. Thirty-seven days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting (DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The growth duration of the tested materials was ranged from 137 to 141 days whereas the growth duration of the check varieties ranged from 137 (BRRI dhan74) to 148 days (BRRI dhan89). The plant height of the tested entries was varied from 105 to 126cm. The effective tiller of the tested entries was varied from 11 to 15The yield range was 5.27t/ha (NGR1-1-1-B) to 6.77t/ha (BRBa 3-1-7). Only one tested entry BRBa 3-1-7(6.77t/ha) found to be outyielded over the highest yielded check variety BRRI dhan74(6.72t/ha) with a growth duration of 137days (Table 28).

Table 28: Yield and ancillary characters of selected AYT #7 genotypes, Boro 2023-24

Entry	Designation	GD (Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BRBa 3-1-7	137	113	14	6.77
2	BRBa40-NGR 1255-1	140	118	13	6.15
3	NGR1-1-1-B	141	118	12	5.27
4	NGR5-1-9-B	140	115	11	6
5	NGR31-1-4-B	138	113	12	5.45
6	NGR31-1-5-B	138	112	12	6.2
7	NGR43-1-1-B	137	112	11	5.74
8	NGR43-1-2-B	139	124	13	5.89
9	NGR64-1-5-B	137	112	12	5.92
10	NGR65-2-4-B	137	105	13	5.76
11	NGR71-2-3-B	138	110	13	5.36
12	NGR78-1-2-B	139	121	12	5.55
13	NGR87-1-1-B	140	121	11	6.02
14	NGR116-1-3-B	139	126	11	5.94
Ck	BRRI dhan74	137	98	10	6.72
Ck	BRRI dhan89	148	107	11	6.23
	CV (%)	**1.93**	**6.29**	**8.48**	**8.03**
	Lsd (0.05)	**4.42**	**11.8**	**1.66**	**0.78**
	D/S- 10.12.24			**D/T- 16.01.24**	

Expt.4.3.12: Advanced Yield Trial (AYT#8) for Favorable Boro during Boro 2023-24

Objective: The advanced yield trial was conducted to evaluate the specific and general adaptability of the advanced lines as compared with standard checks in on-station conditions at Charbadna farm, Barishal.

Materials and method: A total of ten entries along with three checks BRRI dhan74, BRRI dhan101 and BRRI dhan 102 were grown at Charbadna farm, BRRI, Barishal. The unit plot size was 5.4 m x 2 m following RCB design with three replications. Forty-five days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were given at 260: 110: 120: 110: 10 kg/ha Urea, TSP, MoP, Gypsum and Zinc Sulphate. Full amount of TSP, gypsum & $ZnSO_4$ and 2/3rd MoP were applied at the time of final land preparation. Urea was top dressed in three installments at 15, 30 and 45 days after transplanting

(DAT). Rest MoP was top dressed along with 3rd top dress of Urea. Other cultural practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The growth duration of the tested materials was ranged from 139 to 150 days whereas the growth duration of the check varieties ranged from 135 (BRRI dhan74) to 144 days (BRRI dhan102). The plant height of the tested entries was varied from 106 to 118cm. The effective tiller of the tested entries varied from 7 to 10 The yield range was 5.1-7.1t/ha. Six entries viz., BRBa21-4-1-2-1-P4(7.1t/ha), BRBa26-1-1-1-2(7.1t/ha), BRBa24-2-4-1-1-1-B(6.9t/ha), BRBa23-11-5-2-1-P2(6.75t/ha), BRBa21-13-2-2-1(6.71t/ha) and BRBa23-5-3-3-5(6.67t/ha) found out yielded over the highest yielded check variety BRRI dhan74(6.6t/ha) (Table 29).

Table 29: Yield and ancillary characters of selected AYT#8 genotypes, Boro 2023-24.

Entry	Designation	GD (Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BRBa22-3-2-1-1-2-1	141	118	10	5.14
2	BRBa22-7-7-1-1-2-1-P1	141	110	8	5.14
3	BRBa24-1-2-4-1-1-B-p1	148	107	9	6.55
4	BRBa24-2-4-1-1-1-B	150	115	10	6.92
6	BRBa21-4-1-2-1-P4	148	110	8	7.09
7	BRBa21-13-2-2-1	148	110	8	6.71
8	BRBa23-5-3-3-5	148	107	10	6.67
9	BRBa23-11-5-2-1-P2	148	110	9	6.75
10	BRBa26-1-1-1-2	139	106	7	7.11
Ck	BRRI dhan74	135	98	10	6.59
Ck	BRRI dhan101	134	110	9	6.36
Ck	BRRI dhan102	144	106	11	6.25
	CV (%)	**3.52**	**4.22**	**15.09**	**11.05**
	Lsd (0.05)	**8.39**	**7.64**	**2.3**	**1.18**

D/S- 07.12.23 **D/T- 21.01.24**

Expt.4.4.1. Regional Yield Trial (RYT_RLR#1) for development of Rainfed Lowland Rice T. Aman 2023

M A Kader, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of nine genotypes along with two checks viz. BRRI dhan71 and BRRI dhan75 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2.4 m following the RCB design with three replications. Twenty -nine days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 15 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The yield range among the tested entries varied from 3.29 to 4.09t/ha. Only one genotype i.e., BR12005-6R-14(4.09t/ha) found outyielded over the highest yielded check variety BRRI dhan71 (3.95t/ha). The growth duration range was found 117-132 days (Table 30).

Table 30: Yield and ancillary character of RYT-RLR#1 materials, T. Aman 2023, BRRI, Barishal**.**

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR12001-6R-205	117	127	5	3.31
2	BR10795-6R-133	119	134	5	3.29
3	BR12005-6R-14	132	123	6	4.09
4	BR10797-6R-140	119	114	6	3.46
5	BR10799-6R-104	128	121	7	3.61
6	BR12007-6R-61	Totally damaged by rat			
7	BR11333-6R-4	124	108	6	3.43
8	BR11333-6R-84	122	107	7	3.54
9	BR10799-6R-31	127	124	6	3.69
10	BRRI dhan71 (ck)	118	112	6	3.95
11	BRRI dhan75 (ck)	Totally damaged by rat			
	CV (%)	**4.12**	**6.51**	**13.46**	**8.43**
	Lsd (0.05)	**8.52**	**13.01**	**1.42**	**0.51**
	D/S- 09.07.23			**D/T- 08.08.23**	

Expt.4.4.2: Regional Yield Trial (RYT_RLR #2) for development of Rainfed Lowland Rice T. Aman 2023.

M A Kader, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of seven genotypes along with two checks viz. BRRI dhan49 and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2.4 m following the RCB design with three replications. Twenty-eight days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 15 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The yield range among the tested entries was varied from 3.15 to 4.33t/ha. Only one genotype i.e., BR11336-6R-10 (4.33t/ha) found outyielded over the highest yielded check variety BRRI dhan87 (4.28t/ha). The growth duration range was found 119-139days.Incase of most entries less yield found due to lodging at reproductive stage after Cyclone Midhili. (Table31).

Table 31: Yield and ancillary character of RYT-RLR#2 materials, T. Aman 2023, BRRI, Barishal.

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR12011-6R-178	**Totally damaged by rat**			
2	BR10797-6R-24	127	126	8	3.30
3	BR10799-6R-70	119	125	8	3.31
4	BR11343-6R-51	129	96	9	3.92
5	BR11227-6R-98	139	153	7	3.15
6	BR10802-6R-66	132	133	6	3.60
7	BR11336-6R-10	132	144	6	4.33
8	BRRI dhan49 (ck)	130	98	10	3.86
9	BRRI dhan87 (ck)	128	122	7	4.28
CV (%)		**3.95**	**16**	**21**	**9.30**
Lsd (0.05)		**8.67**	**3.19**	**2.70**	**0.79**
D/S- 09.07.23				**D/T- 07.08.23**	

Expt.4.4.3: Regional yield trial (RYT#LA) development of Low Amylose Rice T. Aman 2023.

J Ferdous, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of five entries along with two checks, BRRI dhan71 and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 3.01m following the RCB design with three replications. Twenty-seven days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25 cm x 15 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: None of the tested entries found better comparing with check varieties. BRRI dhan71 (3.65t/ha) and BRRI dhan87(4.32t/ha). The growth duration of the tested genotype varied from 115 to 128 days which is similar to the growth duration of the check varieties. The lower yield was caused due to severe infestation of rats and birds at vegetative and reproductive stages respectively. Moreover, the trial was flooded two times by high tide and remained submerged for a couple of days in every time. (Table 32).

Table32: Yield and ancillary character of RYT#LA, T. Aman 2023, BRRI, Barishal

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR(Bio)10381-AC11-7-1	128	118	8	4.35
2	BR(Bio)10381-11-8-1	**Damaged by rat at reproductive stage**			
3	BR(Bio)13031-AC1-2	115	106	7	3.30
4	BRRI dhan71(ck)	115	111	8	3.65
5	BRRI dhan87 (ck)	128	118	8	4.32
CV(%)		**5.86**	**5.24**	**11.87**	**12.88**
Lsd (0.05)		**12.95**	**10.80**	**1.61**	**0.91**
D/S- 13.07.23				**D/T- 10.08.23**	

Expt.4.4.4: Regional yield trial (RYT#ZER) for development of Zinc Enriched Rice T. Aman 2023

M A Kader, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: Evaluation specific and general adaptability under on-station conditions.

Materials and method: A total of four entries along with four checks, BRRI dhan49 and BRRI dhan72 BRRI dhan87 BRRI dhan93 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2 m following the RCB design with three replications. Twenty-six days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 15 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: None of the tested entries found to be out-yielded over the checks. The yield range of the tested entries was 3.48-3.92t/ha whereas the yield range of the checks was 3.48-4.22t/ha. The growth duration range of the tested genotypes varied from 132-135 days whereas it was found for check varieties from 130 to 133 days (Table 33).

Table33: Yield and ancillary character of RYT#ZER, T. Aman 2023, BRRI, Barishal

Entry	Designation	GD (Days)	PH (cm)	ET (No.)	Yield(t/ha)
1	BR10854-4-1-1-2-8	133	117	6	3.48
2	BR10855-3-2-5-2-5	133	132	9	3.64
3	BR10863-8-3-5-3-2	135	114	8	3.92
4	BR11176-16-7-4-4-2	132	136	7	3.80
5	BRRI dhan49 (ck)	131	103	10	4.22
6	BRRI dhan72 (ck)	131	118	7	4.08
7	BRRI dhan87 (ck)	130	127	7	3.60
8	BRRI dhan93 (ck)	133	117	7	3.48
CV (%)		**1.23**	**8.78**	**20.89**	**9.52**
Lsd (0.05)		**2.76**	**7.91**	**2.67**	**0.61**
D/S- 08.07.23				**D/T- 04.08.23**	

Expt.4.4.5: Regional yield trial (RYT# Tall) development of materials under early transplanting conditions T. Aman 2023.

A S M Masuduzzaman, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of four entries along with two checks, BRRI dhan76 and BRRI dhan91 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 3 m following the RCB design with three replications. Twenty-eight days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25 cm x 15 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The average seedling height of the tested genotypes was 38-67cm whereas average plant height was 119-150cm. Except for one entry BR9392-6-2-1B (2.70t/ha), all the tested entries found to be out yielded over the highest yielded check BRRI dhan76 (3.16t/ha).The

growth duration range of the tested genotype was 133-139 days. Less yield was found due to acute lodging at a reproductive stage after Cyclone Midhili (Table 34).

Table34: Yield and ancillary character of RYT#Tall materials, T. Aman 2023, BRRI, Barishal

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR9892-8-2-2B	137	119	6	3.49
2	BR10247-14-18-7-3	136	123	6	3.53
3	BR10238-5-1-9-2B	133	119	7	3.60
4	BR9392-6-2-1B	139	150	7	2.70
5	BRRI dhan76 (ck)	143	144	7	3.16
6	BRRI dhan91 (ck)	143	158	7	2.51
CV (%)		**1.84**	**6.36**	**8.44**	**8.82**
Lsd (0.05)		**4.40**	**4.90**	**0.98**	**0.48**
D/S- 08.07.23				**D/T- 06.08.23**	

Expt.4.4.6: Regional yield trial (RYT# 1_Aromatic) development of Antioxidant Enriched Rice T. Aman 2023

S Ghosal, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of five entries along with two checks, BRRI dhan34 and BRRI dhan70 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2.4 m following the RCB design with three replications. Twenty-nine days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The yield range of the tested entries was varied from 2.47t/ha to 2.75t/ha. None of the tested entries found better comparing with check varieties. The growth duration range was found 123-135days. Incase of most entries less yield found due to lodging at reproductive stage after Cyclone Midhili. Moreover, the trial was flooded by two times high tide and remained submerged for few days in every time (Table 35).

Table35: Yield and ancillary character of RYT#1, Antioxidant_Aromatic materials, T. Aman 2023, BRRI, Barishal

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR12836-4R-63	135	106	7	2.47
2	BR12836-4R-312	125	104	6	2.75
3	BR12839-4R-124-2	123	113	7	2.67
4	BR12839-4R-51	124	105	7	2.52
5	BR12838-4R-89-1	132	108	8	2.74
6	BRRI dhan34	140	143	8	2.87
7	BRRI dhan70	132	132	8	3.41
CV (%)		**4.54**	**8.61**	**12.39**	**9.27**
Lsd (0.05)		**6.08**	**7.07**	**1.56**	**0.44**
D/S- 06.07.23				**D/T- 05.08.23**	

Expt.4.4.7: Regional yield trial (RYT#2_Antioxidant) development of Antioxidant Enriched Rice T. Aman 2023

S Ghosal, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of seven entries along with two checks viz. BRRI dhan49 and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2.4 m following the RCB design with three replications. Twenty-five days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K, and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The yield range of the tested entries was varied from 3.05t/ha to 4.10t/ha. Only one genotype i.e., BR12839-4R-137 found outyielded over the highest yielded check variety BRRI dhan87 (4.07t/ha). The growth duration range was found 120-132 days. Less yield of the genotypes was found as the trial was flooded two times at high tide and remained submerged for a few days in every time (Table 36).

Table 36: Yield and ancillary character of RYT#2 Antioxidant materials, T. Aman 2023, BRRI, Barishal

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR12839-4R-106	132	118	7	3.11
2	BR12839-4R-34-1	123	106	8	3.40
3	BR12839-4R-76	120	103	7	3.05
4	BR12839-4R-137	123	110	9	4.10
5	BR12839-4R-86-1	123	113	7	3.17
6	BR12839-4R-90-1	127	111	7	3.76
7	BR12839-4R-72	**Totally Damaged by rat**			
8	BRRI dhan87	130	124	9	4.07
9	BRRI dhan49	132	103	12	3.96
	CV (%)	**3.37**	**7.05**	**19.70**	**9.89**
	Lsd (0.05)	**7.21**	**3.24**	**2.71**	**0.60**
	D/S- 06.07.23			**D/T- 01.08.23**	

Expt.4.4.8: Regional yield trial (RYT) development of Salt tolerant Rice T. Aman 2023

M A Rahman, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on station condition.

Materials and method: A total of twelve entries along with two checks BRRI dhan73 and BRRI dhan87 were grown at BRRI Charbadna farm, Barishal during T. Aman 2023. The unit plot size was 5.4 m x 2m following the RCB design with three replications. Twenty-eight days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 20 cm x 20 cm. Fertilizer doses were 80-60-40-20 kg/ha N-P-K-S with split application of N (40+20+20) kg/ha. Total amount of P, K and S were applied at the time of final land preparation. Other cultural practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The genotype BR13111-4R-63 (3.62t/ha) was found as out-yielded compared with the highest yielded check variety BRRI dhan87 (3.61 t/ha). The growth duration of the tested genotypes varied from 112 to 127 days whereas the growth duration of the check variety was ranged from 118-130 days. The lower yield was caused by to severe infestation of rats and birds at vegetative and reproductive stages respectively. Moreover, the trial was flooded by two times high tide and remained submerged for a couple of days every time (Table 37).

Table 37: Yield and ancillary character of RYT#STR, T. Aman 2023, BRRI, Barishal

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)	Remarks
1	BR13113-4R-63	118	97	8	3.05	10% rat damage
2	BR13125-4R-92	118	99	8	3.11	10% rat damage
3	BR13118-4R-76	126	108	7	2.82	10% rat & 20% bird damage
4	BR13113-4R-185	121	90	7	2.65	15% rat & 30% bird damage
5	BR13111-4R-191	127	107	7	2.57	15% rat & 30% bird damage
6	BR13106-4R-469	112	110	6	2.55	15% rat & 20% bird damage
7	BR13108-4R-232	118	112	6	3.06	10% rat damage
8	BR13106-4R-438	118	104	6	3.15	10% rat damage
9	BR13111-4R-63	118	108	7	3.62	10% rat damage
10	BR13106-4R-184	127	103	7	3.53	15% rat damage
11	BR13122-4R-136	118	107	5	2.95	10% rat & 20% bird damage
12	BR13113-4R-116	126	103	7	3.00	15% rat damage
13	BRRI dhan73	118	124	6	3.31	10% rat damage
14	BRRI dhan87	130	118	8	3.61	-
	CV (%)	**4.12**	**6.40**	**14.42**	**10.58**	
	Lsd (0.05)	**8.23**	**11.23**	**1.60**	**0.54**	

D/S- 10.07.23 **D/T- 8.08.23**

Expt.4.4.9: Regional Yield Trial for Favorable Rice, Barishal (RYT# FBR_Barishal) during Boro 2023-24

T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: On-station evaluation of the advanced breeding lines for adaptability along with the check varieties in different regional satations and BRRI headquarters.

Materials and method: One regional yield trial of favorable boro rice (RYT#FBR_Barishal) was conducted at BRRI, Gazipur and ten other regional stations of BRRI during Boro 2023-24. Tested genotypes including the standard checks are mentioned in the table 38. The unit plot size was 5.4 m x 2 m following RCB design with three replications. Forty days old seedlings of each genotype were transplanted @ 2-3 seedlings with a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days intervals starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: Among the tested materials, the plant height was ranged from 97.84 cm of NGR745-2to 105.03 cm of NGR750-1 a. NGR350-2 took the shortest period (146 days) at to get matured while NGR736-1, NGR745-3 and NGR745-2 took the longest period (153 days) to get matured. The highest average grain yield (9.02 t/ha) was found in NGR1161-3 at Bhanga and the lowest average grain yield (3.79t/ha) was found in NGR1161-3 at Cumilla.The check yields of BRRI dhan74 was ranged from 5.13 t/ha at Gazipur to7.86 t/ha at Bhanga whereas another check variety BRRI dhan102 gave 4.77t/ha at Gazipur to 8.42t/ha at Bhanga. There was significant yield variation found among 11 test locations. On average, the test line NGR736-1 (7.11t/ha) performed the highest yield over the locations and seven tested entries performed 0.14 to 4.20% higher yield over the check variety BRRI dhan102 (6.82 t/ha) (Table 38).

Table 38. Yield and ancillary characters of RYT (FBR_Barishal) genotypes, Boro 2023-2024

Designation	Average PH (cm)	Average GD (day)	TGW(g)	Yield (t/ha)		
				Lowest (location)	Highest(location)	Avg.
NGR350-2	98.03	146	31.1	5.66 (Gazipur)	7.98 (Rangpur)	7.02
NGR472-2	98.58	150	21.6	4.54 (Gazipur)	8.91 (Bhanga)	6.98
NGR736-1	100.32	153	23.4	5.53 (Gazipur)	8.02 (Bhanga)	7.11
NGR745-3	99.35	153	23.1	5.41 (Gazipur)	8.30 (Bhanga)	6.95
NGR994-1	99.71	152	22.7	5.21 (Gazipur)	8.36 (Bhanga)	7.01
NGR745-2	97.84	153	22	4.83 (Cumilla)	8.39 (Bhanga)	6.9
NGR749-2	98.67	153	22.9	4.53 (Cumilla)	8.21 (Bhanga)	6.83
NGR750-1	105.03	153	24.7	5.39 (Gazipur)	8.09 (Rajshahi)	6.70
NGR796-2	101.01	151	23.2	4.14 (Gazipur)	8.47 (Bhanga)	6.68
NGR1161-3	99.99	150	21.5	3.79 (Cumilla)	9.02 (Bhanga)	6.48
BRRI dhan74	94.68	146	30.4	5.13 (Gazipur)	7.86 (Bhanga)	6.64
BRRI dhan102	103.99	153	21.6	4.77 (Gazipur)	8.42 (Bhanga)	6.82
LSD at 0.05	**4.41**	**4.08**	**-**			**0.24**
CV (%)	**2.67**	**1.63**	**-**			**2.13**

L1= BRRI Barishal; L2= BRRI Bhanga; L3= BRRI Cumilla; L4= BRRI Gazipur; L5= BRRI Gopalganj; L6= BRRI Habiganj; L7= BRRI Kustia; L8= BRRI Rajshahi; L9= BRRI Rangpur; L10= BRRI Satkhira; L11= BRRI Sirajganj

Table 39. Yield Performance of different RYT#FBR (Barishal) genotypes in different locations (11), Boro 2023-2024

Designation	Barishal	Bhanga	Cumilla	Gazipur	Gopalganj	Habiganj	Kustia	Rajshahi	Rangpur	Satkhira	Sirajganj	Av. GD	Av. GY
BRBaNGR350-2*	7.41	7.35	5.97	5.66	7.38	7.29	6.89	7.00	7.98	7.45	6.78	146	7.02
BRBaNGR472-2*	7.05	8.91	5.80	4.55	7.28	6.11	6.78	8.06	7.79	6.44	7.97	150	6.98
BRBaNGR736-1*	7.55	8.02	6.03	5.54	7.54	6.73	7.34	7.50	7.33	6.76	7.88	153	7.11
BRBaNGR745-3*	7.02	8.30	5.61	5.41	7.31	7.03	7.20	7.66	6.87	6.74	7.30	153	6.95
BRBaNGR994-1*	6.22	8.36	5.98	5.21	7.14	7.26	7.10	7.65	8.04	7.28	6.89	152	7.01
BRBaNGR745-2*	6.82	8.39	4.83	5.51	7.14	7.25	7.31	7.73	7.04	6.52	7.35	153	6.90
BRBaNGR749-2	6.86	8.21	4.53	4.67	6.56	6.92	7.32	7.90	8.08	6.65	7.46	153	6.83
BRBaNGR750-1	6.24	7.50	5.97	5.39	7.24	5.52	6.88	8.09	7.46	5.85	7.58	153	6.70
BRBaNGR796-2	7.27	8.47	6.07	4.14	7.17	6.59	6.73	7.36	7.06	5.92	6.71	151	6.68
BRBaNGR1161-3	6.34	9.02	3.79	4.14	7.03	6.10	7.01	7.31	7.72	5.67	7.18	150	6.48
BRRI dhan74	6.58	7.86	5.62	5.13	6.86	6.76	6.60	6.86	7.17	6.70	6.85	146	6.64
BRRI dhan102	6.86	8.42	5.46	4.77	7.38	7.12	7.30	7.61	7.70	5.57	6.87	153	6.82

Expt.4.4.10. Regional Yield Trial for Favorable Boro of Short Duration Genotypes, Boro 2023-24

P S Biswas, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: The regional yield trial was conducted to understand general and regional adaptability and select the best-performing advanced breeding lines with the highest genetic merits.

Materials and method: A total of eight genotypes along with two checks viz. BRRI dhan88 and BRRI dhan96 were grown at Charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4m x 2.0m following RCBD design with three replications. Forty days old seedlings of each genotype were transplanted with a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, TSP, MoP, gypsum and zinc sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full dose of other fertilizers were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height, tiller/hill, panicle/hill, panicle length, fertility (%), 1000-grain weight and grain yield.

Results: Two entries viz., BR12671-4R-95(5.95t/ha) and BR12574-5R-52(5.94t/ha) were found to yield over the highest yielded check BRRI dhan88(5.48t/ha). The growth duration range of the tested entries was found 144-146 days. (Table 40).

Table 40. Yield and ancillary character of RYT#FBR_SD, Boro 2023-24, BRRI, Barishal

Entry	Designation	GD(Days)	PH(cm)	Yield(t/ha)
1	BR12574-5R-168	144	116	5.44
2	BR12574-5R-52	144	112	5.94
3	BR12520-5R-67	144	98	4.91
4	BR12667-4R-86	144	101	5.06
5	BR12671-4R-95	146	121	5.95
6	BR12676-4R-392	144	89	5.13
7	BR12682-4R-50	145	112	5.45
8	BR12208-4R-278	145	90	5.22
9	BRRI dhan88	144	90	5.48
10	BRRI dhan96	144	87	5.11
	CV (%)	**0.54**	**9.26**	**11.6**
	Lsd (0.05)	**1.31**	**15.81**	**1.07**
	D/S- 08.12.23		**D/T- 17.01.24**	

Expt.4.4.11. Regional Yield Trial for Favorable Boro of Medium Duration genotype, Boro 2023-24

P S Biswas, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: The regional yield trial was conducted to understand general and regional adaptability and select the best-performing advanced breeding lines with the highest genetic merits.

Materials and method: A total of nine genotypes along with three checks viz. BRRI dhan58, BRRI dhan89 and BRRI dhan102 were grown at Charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4 m x 2.0 m. The experiment was done following RCB design with three replications. Thirty-nine days old seedlings of each genotype were transplanted with a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, TSP, MoP, gypsum and zinc sulfate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Full dose of other fertilizers was applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm.) and grain yield (t/ha).

Results: Two entries viz., BR12517-5R-57(6.36t/ha) and IR18A1398 (6.20 t/ha) found yielded over the highest yielded check BRRI dhan89(6.07t/ha). The yield range of the tested entries was 5.00-6.36t/ha with a growth duration range of 144-162 days (Table 41).

Table 41: Yield and ancillary characters of RYT#FBR-MD genotypes, Boro 2023-24

Entry	Designation	GD (Days)	PH (cm)	Yield(t/ha)
1	BR12508-5R-5	153	98	5.97
2	BR12517-5R-57	153	102	6.36
3	BR12514-5R-97	144	88	5.54
4	BR12520-5R-11	144	97	5.97
5	BR12423-6R-38	153	105	5.39
6	BR12514-5R-27	150	96	4.94
7	IR18A1398	162	109	6.20
8	BR11318-5R-148	153	108	5.30
9	BR11894-5R-260	153	103	5.00
10	BRRI dhan58	150	91	5.41
11	BRRI dhan89	153	107	6.07
12	BRRI dhan102	150	100	5.56
	CV (%)	**2.48**	**6.21**	**8.28**

Lsd (0.05)	**6.21**	**10.37**	**0.81**
D/S- 30.11.23		**D/T- 8.01.24**	

Expt.4.4.12. Regional Yield Trial for Extra Long Slender under Development of Favorable Boro rice, Boro 2023-24

P S Biswas, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: The regional yield trial was conducted to understand general and regional adaptability and select the best-performing advanced breeding lines with the highest genetic merits.

Materials and method: A total of four genotypes along with twoe checks viz. BRRI dhan63 and BRRI dhan104 were grown at BRRI charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4m x 2.0m following RCBD design with three replications. Thirty four days old seedlings of each genotype were transplanted @ 2-3 seedlings with a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha).

Results: None of the tested entries found out yielded over the highest yielded check BRRI dhan63(5.84t/ha). The yield range of the tested entries was 4.91-5.84t/ha with a growth duration rage of 146-151 days (Table 42).

Table 42: Yield and ancillary characters of RYT# ELS_FBR, Boro 2023-24

Entry	Designation	GD(Days)	PH (cm)	Yield(t/ha)
1	BR7528-2R-19-16-RIL-52	146	103	5.32
2	BR7528-2R-19-16-RIL-55	151	102	4.99
3	BR7528-2R-19-16-RIL-59	151	103	5.15
4	BR9945-5R-21	150	102	4.91
5	BRRI dhan63	146	87	5.84
6	BRRI dhan104	146	101	5.17
CV (%)		**1.62**	**4.47**	**6.04**
Lsd (0.05)		**4.17**	**7.75**	**0.53**
D/S- 06.12.23			**D/T- 09.01.24**	

Expt.4.4.13. Regional Yield Trial for Semi Medium Duration under Development of Favorable Boro rice, Boro 2023-24

T Saha, P L Biswas, P S Biswas, Q S A Jahan and MAI Khan

Objective: The regional yield trial was conducted to understand general and regional adaptability and select the best-performing advanced breeding lines with the highest genetic merits.

Materials and method: A total of ten genotypes along with four checks viz. BRRI dhan58, BRRI dhan88, BRRI dhan89 and BRRI dhan102 were grown at BRRI charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4m x 2.0m following RCBD design with three replications. Thirty seven days old seedlings of each genotype were transplanted @ 2-3 seedlings with a spacing of 20cm x 20cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate at final land preparation. Crop management practices were

done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha).

Results: Only one entry i.e., BR13027-BC1-3R-77(6.4t/ha) was found out yielded over the highest yielded check BRRI dhan89(6.18t/ha). The yield range of the tested entries was 4.45-6.40t/ha with a growth duration rage of 141-150 days (Table 43).

Table 43: Yield and ancillary characters of RYT# SMD_FBR, Boro 2023-24

Entry	Designation	GD(Days)	PH (cm)	Yield(t/ha)
1	BR13027-BC1-3R-77	149	106	6.40
2	IR17A2875	147	98	4.67
3	BR11894-R-R-R-R-158	147	97	4.88
4	BR11894-R-R-R-R-148	147	95	4.64
5	BR11894-R-R-R-R-115	147	103	4.65
6	IR18A2427	147	106	4.45
7	IR17A2922	147	99	4.83
8	IR19A7068	147	97	5.12
9	BR11894-R-R-R-R-105	147	100	5.43
10	BR11894-R-R-R-R-329	141	99	5.16
11	BRRI dhan58	149	90	5.40
12	BRRI dhan88	141	85	5.36
13	BRRI dhan89	150	105	6.18
14	BRRI dhan102	150	102	5.23
	CV (%)	**2.09**	**6.38**	**11.03**
	Lsd (0.05)	**5.05**	**10.51**	**0.98**
	D/S- 03.12.23			**D/T- 09.01.24**

Expt.4.4.14: Regional yield trial (RYT# Tall) development of materials under early transplanting conditions Boro 2023-24

A S M Masuduzzaman, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on-station conditions.

Materials and method: A total of four genotypes along with one check BRRI dhan102 were grown at BRRI Charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4 m x 2.25 m following the RCB design with three replications. Thirty-nine days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25 cm x 15 cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: The average yield range of the tested entries was 4.73-6.74 t/ha. One entryi.e.,.BR9396-6-2-2B (6.74t/ha) was found out yielded over the check variety BRRI dhan102 (6.03t/ha). The growth duration range of the tested entries was observed 138-149 days whereas it was found in the check 144 days (Table 44).

Table 44: Yield and ancillary character of RYT#Tall materials, Boro 2023-24, BRRI, Barishal

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR9892-8-2-2B	149	114	8	5.11
2	BR10247-14-18-7-3B	149	117	9	5.10
3	BR10238-5-1-9-3B	148	117	9	4.73
4	BRH9392-6-2-1-3-4	149	116	9	5.43
5	BR9396-6-2-2B	138	99	10	6.74
6	BRRI dhan102 (ck)	144	102	10	6.03
	CV (%)	**2.03**	**7.65**	**10.26**	**10.28**
	Lsd (0.05)	**5.13**	**14.64**	**1.64**	**0.98**
	D/S- 14.12.23			**D/T- 22.01.24**	

Expt.4.4.15: Regional Yield Trial-2 (Blast), Boro (Long duration), Boro 2023-24

TH Ansari, M Khatun, T. Saha, P L Biswas, QSA Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on-station conditions.

Materials and method: The trial was conducted at two locations of BRRI Charbadna farm, Barishal and in a farmer's field at Kashipur, Barishal.Five lines along with one standard check BRRI dhan29were tested under this trial during Boro 2023-24. The unit plot size was 5.4m x 2.5m following RCBD design with three replications. Forty to forty-five days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25cm x 15cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: In Charbadna farm, the average yield range of the tested entries wasfound 5.63-6.51t/ha. Except one all the tested entries found outyielded over the check variety BRRI dhan29(6.19t/ha). The test lineBR (Path) 15855-BC3-2HR-11(6.51t/ha) gave highest yield with a growth duration of 151days which was more or less similar to the check variety. Whereas in Farmer's field, the average yield range of the tested entries was found 5.71-6.37t/ha. Three tested entries were found out-yielded over the check variety BRRI dhan29(6.04t/ha). The test line BR (Path) 15855-BC3-2HR-11 (6.37t/ha) gave highest yield with a growth duration of 152 days which was two days longer than the check variety.

Table 45: Yield and ancillary characters of RYT#2 Blast_LD genotypes, Boro 2023-24 at Charbadna, BRRI

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR (Path) 15855-BC3-2HR-5	143	98	11	6.49
2	BR (Path) 15855-BC3-2HR-11	151	110	10	6.51
3	BR (Path) 15855-BC2-3HR-8	143	105	9	6.07
4	BR (Path) 15855-BC2-3HR-23	149	104	8	6.22
5	BR (Path) 15855-BC2-3HR-47	150	104	10	5.63
6	BRRI dhan29 (S. Check)	150	99	10	6.19
	CV (%)	**1.99**	**4.50**	**12.75**	**4.97**
	Lsd (0.05)	**5.11**	**8.07**	**2.19**	**0.53**
	D/S- 04.12.23			**D/T- 13.01.24**	

Table 46: Yield and ancillary characters of RYT#2 Blast_LD genotypes, Boro 2023-24 at Kashipur, Barishal

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR (Path) 15855-BC3-2HR-5	142	104	10	6.11
2	BR (Path) 15855-BC3-2HR-11	152	109	11	6.37
3	BR (Path) 15855-BC2-3HR-8	145	106	10	5.90
4	BR (Path) 15855-BC2-3HR-23	150	105	9	6.30
5	BR (Path) 15855-BC2-3HR-47	151	105	10	5.71
6	BRRI dhan29 (S. Check)	150	97	10	6.04
CV (%)		**2.14**	**3.70**	**7.00**	**4.64**
Lsd (0.05)		**5.48**	**6.68**	**1.19**	**0.48**

D/S- 04.12.23 **D/T- 18.01.24**

Expt.4.4.16: Regional Yield Trial-3 (Blast), Boro (Medium duration), Boro 2023-24

TH Ansari, M Khatun, T. Saha, P L Biswas, QSA Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on-station conditions.

Materials and method: The trial was conducted at two locations of BRRI Charbadna farm, Barishal and in a farmer's field at Kashipur, Barishal during Boro 2023-24. The unit plot size was 5.4m x 2.5m following RCBD design with three replications. Forty to forty-five days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25cm x 15cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: In Charbadna farm, the average yield range of the tested entries was found 5.80-6.11t/ha. None of the tested entries found outyielded over the highest yielded check variety BRRI dhan89(6.33t/ha). The growth duration range of the tested entries was 138-139 days. Whereas inFarmer's field, the average yield range of the tested entries was found 5.88-6.06t/ha. None of the tested entries found outyielded over the highest yielded check variety BRRI dhan89(6.14t/ha). The growth duration range of the tested entries was 138-140 days.

Table 47: Yield and ancillary characters of RYT#2 Blast_MD genotypes, Boro 2023-24 at Charbadna, BRRI

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR (Path) 15854-BC1-3HR-21	138	95	9	5.80
2	BR (Path) 15853-BC1-3HR-3	139	93	9	6.11
3	BRRI dhan58(Ck)	141	95	9	6.10
4	BRRI dhan89(Ck)	147	107	8	6.33
CV (%)		**1.15**	**4.62**	**10.06**	**2.12**
Lsd (0.05)		**2.97**	**8.17**	**1.63**	**0.23**

D/S- 04.12.23 **D/T- 14.01.24**

Table 48: Yield and ancillary characters of RYT#2 Blast_MD genotypes, Boro 2023-24 at Kashipur, Barishal

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	BR (Path) 15854-BC1-3HR-21	138	100	9	5.88
2	BR (Path) 15853-BC1-3HR-3	140	96	8	6.06
3	BRRI dhan58(Ck)	142	98	9	5.97
4	BRRI dhan89(Ck)	149	108	8	6.14
CV (%)		**1.11**	**3.74**	**11.07**	**3.87**
Lsd (0.05)		**2.87**	**6.84**	**1.70**	**0.42**

D/S- 04.12.23 **D/T- 18.01.24**

Expt.4.4.17: Regional Yield Trial-4 (Blast), Boro (Short duration), Boro 2023-24

TH Ansari, M Khatun, T. Saha, P L Biswas, QSA Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on-station conditions.

Materials and method: This trial was conducted at two locations of BRRI Charbadna farm, Barishal and in farmer's field at Kashipur, Barishal. Five lines along with two standard checks BRRI dhan28and BRRI dhan88 were tested at BRRI Charbadna farm, Barishal, during Boro 2023-24. The unit plot size was 5.4m x 2.5m following RCBD design with three replications. Forty-one days old seedlings of each genotype were transplanted @2-3 seedlings with a spacing of 25cm x 15cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days interval starting from 15 DAT. Total amounts of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: In Charbadna farm, the average yield range of the tested entries was found 5.37-6.03t/ha. Only one tested entry i.e., BR (Path) 15641-3HR-15(6.03t/ha) found to be outyielded over the highest yielded check variety BRRI dhan88(5.90t/ha). The growth duration range of the tested entries was 136-145 days. Whereas in Farmer's field, the average yield range of the tested entries was found 5.49-5.87t/ha. Only one tested entry i.e BR (Path) 15641-3HR-15 (5.87t/ha) found to be outyielded over the highest yielded check variety BRRI dhan88(5.55t/ha). The growth duration range of the tested entries was 135-145 days.

Table 49: Yield and ancillary characters of RYT#2 Blast_SD genotypes, Boro 2023-24 at Charbadna, BRRI

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR (Path) 15641-3HR-15	136	100	8	6.03
2	BR (Path) 15857-BC3-4HR-6	138	99	9	5.69
3	BR (Path) 15641-3HR-12	145	110	9	5.37
4	BRRI dhan28(Ck)	136	96	10	5.86
5	BRRI dhan88(Ck)	135	95	9	5.90
CV (%)		**2.88**	**5.89**	**8.79**	**4.67**
Lsd (0.05)		**7.01**	**10.39**	**1.39**	**0.48**

D/S- 07.12.23 **D/T- 17.01.24**

Table 50: Yield and ancillary characters of RYT#2 Blast_SD genotypes, Boro 2023-24 at Kashipur, Barishal

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR (Path) 15641-3HR-15	135	101	9	5.87
2	BR (Path) 15857-BC3-4HR-6	139	100	7	5.53
3	BR (Path) 15641-3HR-12	145	111	8	5.49
4	BRRI dhan28(Ck)	137	97	8	5.26
5	BRRI dhan88(Ck)	135	94	9	5.55
CV (%)		**2.87**	**5.57**	**11.68**	**5.37**
Lsd (0.05)		**6.99**	**9.88**	**1.67**	**0.52**

D/S- 07.12.23 **D/T- 18.01.24**

Expt.4.4.18: Regional Yield Trial for Favorable Boro (Bio), Boro 2023-24

J Ferdous, T. Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate the specific and general adaptability of the advanced breeding lines as compared with standard checks in on-station conditions.

Materials and method: A total of six entries along with two checks BRRI dhan86 and BRRI dhan96 were grown at BRRI Charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4m x 2.5m following the RCB design with three replications. Forty-two day-old seedlings of each genotype were transplanted @ 2-3 seedlings with a spacing of 25cm x 15cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days intervals starting from 15 DAT. The total amount of TSP, MoP, Gypsum, and Zinc Sulphate were applied at the final land preparation. Crop management practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha).

Results: The growth duration range was 145-147 days and the yield range was 3.72-5.46 t/ha. Two tested entries were found out yielded over the highest yielded check variety BRRI dhan96 (5.41t/ha). The test line BR(Bio)13030-AC13-2-2 gave the highest yield (5.46t/ha) with a growth duration of 146 days (Table 51).

Table 51: Yield and ancillary characters of RYT# Favorable Boro (Bio) genotypes, Boro 2023-24

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR(Bio)13029-AC6-2-6	146	99	9	5.27
2	BR(Bio)13028-AC1-2-2	145	106	9	3.72
3	BR(Bio)13028-AC1-2-3	146	102	9	4.97
4	BR(Bio)13028-AC1-2-4	147	98	9	4.99
5	BR(Bio)13028-AC1-2-7	147	103	9	5.44
6	BR(Bio)13030-AC13-2-2	146	98	9	5.46
7	BRRI dhan86(Ck)	142	93	9	5.35
8	BRRI dhan96(Ck)	142	88	8	5.41
CV (%)		**1.14**	**3.78**	**7.66**	**9.78**
Lsd (0.05)		**2.80**	**6.29**	**1.16**	**0.84**

D/S- 01.12.23 **D/T- 12.01.24**

Expt. 4.4.19: Regional Yield Trial for development of Premium Quality Rice (PQR), Boro 2023-24

M A Kader, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To find of the general and specific adaptability of Basmati rice in Bangladesh in relation to physico-chemical and cooking properties.

Materials and method: A total of sixteen lines along with five checks (BRRI dhan50, BRRI dhan63, BRRI dhan81, BRRI dhan104, Tepiboro) were grown at BRRI Charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4m x 0.6m following RCB design with three replications. Thirty-three days old seedlings of each genotype were transplanted @ 2-3 seedlings with a spacing of 20cm x 15cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal splits at 15 days intervals starting from 15 DAT. The total amount of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, lodging tolerance (%), weather data (minimum temperature, maximum temperature, humidity and rainfall) and grain yield (t/ha).

Results: The average yield range of the tested entries were 1.58-5.42(t/ha) whereas the yield range of the check varieties varies from 3.03-5.79 t/ha. None of the tested entries found outyielded over the highest yielded check variety BRRI dhan50 (5.79t/ha). The growth duration rage of the tested entries found 138-163 days (Table 52).

Table 52: Yield and ancillary characters of RYT# PQR genotypes, Boro 2023-24

Entry	Designation	GD(Days)	PH (cm)	ET(No.)	Yield(t/ha)
1	Basmati (1230)	143	143	12	4.17
2	Basmati (D) (3928)	138	124	14	1.58
3	Basmati (4488)	146	150	12	1.70
4	Basmati (N13) (4493)	163	86	12	2.95
5	Basmati 370 (4494)	138	129	16	4.19
6	Basmati 107 (4501)	138	142	11	3.03
7	Basmati 377 (4507)	138	134	14	2.26
8	Basmati (.4754)	138	121	14	2.83
9	Basmati (6614)	138	128	16	1.96
10	Basmati Sufaid 187	138	138	15	4.11
11	Indian Basmati	146	100	7	2.99
12	Basmati-107 (4501)	138	135	15	3.87
13	Basmati Nanot 439 (4496)	138	94	12	3.91
14	Basmati Pardnr442 (4497)	138	122	15	4.27
15	Basmati-433 (4509)	142	107	12	4.29
16	Pusha Basmati	146	90	11	5.42
17	BRRI dhan50 (Ck)	146	85	13	5.79
18	BRRI dhan63 (Ck)	138	92	12	4.67
19	BRRI dhan81 (Ck)	146	98	11	3.57
20	Proposed BRRI dhan104 (Ck)	138	109	20	3.03
21	Tepi Boro (Ck)	138	148	14	3.46
	CV (%)	**4.25**	**16.93**	**20.04**	**28.01**
	Lsd (0.05)	**12.15**	**14.32**	**5.35**	**2.00**
	D/S- 14.12.23				**D/T- 22.01.24**

Expt.4.4.20: Regional Yield Trial for Zinc Enriched Rice (ZER), Boro 2023-24

M A Kader, T Saha, P L Biswas, Q S A Jahan and MAI Khan

Objective: To evaluate specific and general adaptability of the advanced breeding lines as compared with standard checks in on-station conditions.

Materials and method: A total of six entries along with three checks BRRI dhan74, BRRI dhan89 and BRRI dhan100 were grown at BRRI Charbadna farm, Barishal during Boro 2023-24. The unit plot size was 5.4m x 2m following RCB design with three replications. Forty-one days old seedlings of each genotype were transplanted @ 2-3 seedlings with a spacing of 20cm x 15cm. Fertilizers were applied @ 260:100:120:110:10 kg Urea, Triple Super Phosphate, Muriate of Potash, Gypsum and Zinc Sulphate per hectare respectively. Urea was applied in three equal

splits at 15 days interval starting from 15 DAT. The total amount of TSP, MoP, Gypsum and Zinc Sulphate were applied at final land preparation. Crop management practices were done as and when necessary. Data were recorded on the date of flowering and maturity, plant height (cm), tiller/hill, panicle/hill, panicle length (cm), fertility (%), 1000-grain weight (gm) and grain yield (t/ha). Statistical analysis was performed for mean separation by ANOVA and least significant difference (LSD).

Results: None of the tested entries found out yielded over the highest yielded check variety BRRI dhan74 (7.04t/ha). The yield range of the tested entries was 4.86-6.80t/ha. The growth duration range of the tested entries was 146-151 days (Table 53).

Table 53: Yield and ancillary characters of RYT#ZER genotypes, Boro 2023-24

Entry	Designation	GD(Days)	PH(cm)	ET(No.)	Yield(t/ha)
1	BR10552-1-1-3-4	146	121	9	4.95
2	BR10552-1-1-4-6	146	111	7	5.65
3	BR10570-29-7-3-2	146	98	9	5.58
4	BR10571-15-6-8-5	146	97	7	6.80
5	BR10572-2-7-1-4	151	120	7	4.89
6	BR9674-1-4-1-3-P1	151	114	10	4.86
7	BRRI dhan74 (Ck)	146	99	10	7.04
8	BRRI dhan89 (Ck)	146	112	8	6.17
9	Bangabandhu dhan100 (Ck)	146	109	9	6.02
	CV (%)	**1.46**	**8.50**	**15.52**	**13.99**
	Lsd (0.05)	**3.61**	**15.59**	**2.22**	**1.36**

D/S- 11.12.23 **D/T- 21.01.24**

Expt.4.5: Performance study of released hybrids comparing with standard checks during Boro 2023-24

P L Biswas, T Saha, Q S A Jahan and MAI Khan

Objective: To find out the suitable hybrid rice variety for Barishal district

Materials and Methods: Seventeen entries along with six checks-BRRI hybrid dhan3, BRRI hybrid dhan5, BRRI hybrid dhan8, BRRI dhan74, BRRI dhan89 and BRRI dhan92 were evaluated at Charbadna farm of BRRI R/S, Barishal. Thirty-six days old seedlings were transplanted in 10.80m^2 plot in three replication using single seedling per hill with a spacing of 20cm x 15cm (R x P). Fertilizers were applied @ 260:90:150: 112:11 kg/ha Urea, DAP, MoP, Gypsum and $ZnSO_4$ respectively. Intercultural and agronomic practices were done when necessary.

Result and discussion: Eleven hybrids of different companies and six checks viz. BRRI hybrid dhan3, BRRI hybrid dhan5, BRRI hybrid dhan8, BRRI dhan74, BRRI dhan89 and BRRI dhan92 were evaluated at Charbadna farm, BRRI R/S, Barishal during Boro 2023-24. The yield range of the tested hybrids varied from 6.36 t/ha to 8.23t/ha whereas it was found 6.20t/ha to 8.55t/ha for check varieties. None of the tested hybrids was found out yielded over the highest yielded check variety BRRI hybrid dhan8 (8.55t/ha). The growth duration range of the tested hybrid was 142-148 days whereas for check varieties it was observed 141-149 days.

Table 54: Yield performance of hybrid rice varieties comparing with national hybrids and inbred rice varieties

Sl.	Entry	DM (days)	PH (cm)	ET (no.)	Yield (t/ha)	Yield Advantage (%)			
						BRRI hybrid dhan3	BRRI Hybrid dhan5	BRRI Hybrid dhan8	BRRI dhan92
1	SL-8H	145	101	8	6.85	-15.46	-6.16	-19.88	0.44
2	Moyna	142	104	9	6.96	-14.12	-4.68	-18.61	2.03
3	Hira-2	144	103	9	7.46	-7.92	2.20	-12.73	9.40
4	Taj-1	142	107	8	7.23	-10.84	-1.04	-15.50	5.93
5	BRS-694	143	102	8	7.25	-10.59	-0.76	-15.27	6.22
6	ACI-1	144	104	7	8.23	1.56	12.73	-3.75	20.66
7	Nobin	145	106	8	6.36	-21.50	-12.86	-25.60	-6.73
8	Hira-1	144	104	8	7.95	-1.98	8.80	-7.10	16.46
9	Ruposhi Bangla-4	143	102	7	8.14	0.45	11.49	-4.80	19.34
10	Juboraj	143	100	7	8.12	0.20	11.22	-5.03	19.05
11	3S Agro-3	148	107	8	7.51	-7.31	2.88	-12.16	10.12
12	BRRI Hybrid dhan3	142	105	8	8.11		11.00	-5.22	18.81
13	BRRI Hybrid dhan5	143	104	7	7.30			-14.61	7.04
14	BRRI Hybrid dhan8	144	99	7	8.55				25.36
15	BRRI dhan74	141	89	9	6.20				-9.21
16	BRRI dhan89	149	111	9	6.76				-0.91
17	BRRI dhan92	148	112	9	6.82				
	CV (%)	**1.55**	**4.77**	**10.27**	**9.45**				
	LSD (0.05)	**3.65**	**8.14**	**1.33**	**1.15**				

DS: 15 Dec. 2023; DT: 20 Jan. 2024; Unit plot size: 10.80m2

Legend: DM (days) = Days to maturity (days); PH (cm) = Plant height (cm); ET (no.) = Effective tillers per hill (no.); GY (t/ha) = Grain yield (t/ha)

PROJECT 5: COLLECTION AND CHARACTERIZATION OF LOCAL GERMPLASM

Expt.5.1.1: Characterization of Local Germplasm, T. Aman 2023

T Saha, P L Biswas, Q S A Jahan and MAI Khan

Introduction: Local germplasms are the living genetic resources such as seeds those are maintained for the purpose of plant breeding and other research uses. Germplasm collection is important because crops must be continually enhanced to overcome diseases and pests, expand drought and temperature tolerance, adapt plants to new growing conditions, and make them more productive, nutritious, durable, or simply better tasting. Thus, it is important for collection besides maintenance of the local germplasm to enhance biological diversity in the modern rice variety.

Objective: To collect local rice germplasm from Barishal region to preserve as genetic materials for using in research purpose.

Materials and methods: Around 373 local germplasms, those are still cultivating in the farmers' field, were collected from different Upazilla of Barishal region viz. Barishal, Patuakhali, Barguna, Bhola, Pirojpur and Jhalakathi. Department of Agriculture Extension helped in collecting those germplasms. Germplasms were grown at BRRI Barishal field in six-line plots. Purification was also done through panicle selection from each plot.

Results: Characterization based on seedling height (cm), ligule length (cm), plant height (cm), panicle/hill (no.) and growth duration of 373 local germplasm were done (Table 55). There were duplicates in names, but variation exists in morphological characters. Ten local germplasms viz., Kajolshail, Moulata, Shornogoda, SahiBalam, Sadamota, Balam, Vojan, Horidhan, Thormucra, Shorni-masuri, and Mothamota were utilized in hybridization in breeding program for developing tidal submergence tolerant rice variety. Seeds were harvested and preserved for further evaluation and utilization.

Table 55: Morphological data of 373 local rice germplasm, T. Aman 2023

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
1	Abdul hai	71.5	2.41	151	11.1	145
2	Arman Sordar	72.6	2.76	146	16.4	151
3	Badai chikon	74.1	2.51	151	15.2	145
4	Badhaicikon	72.2	2.46	159	16.6	142
5	Badshabhog	80.4	2.88	162	13.6	149
6	Balamchikon	80.5	2.06	165	12.8	144
7	Bamonkhir	76.8	2.62	152	16.8	143
8	Bamonkhir	64.8	2.67	154	16.3	144
9	Baria Montessor	60.0	3.04	151	17.4	143
10	Barsha	66.2	2.22	166	12.6	150
11	Bashful	75.2	3.33	167	11.4	144
12	Bashful	78.4	2.84	158	13.4	144
13	Bashful	72.6	2.57	172	15.2	142
14	Bashful	71.4	1.94	145	13.8	143
15	Bashful Chikon	64.7	2.28	140	13.8	143
16	Bashful cikon	62.6	2.42	147	15.4	145
17	Bashpair	73.0	2.04	153	15.0	150
18	Bashpair	77.2	2.38	164	13.6	151
19	Bethichikon	76.1	2.64	154	15.4	140
20	Beti cikon	71.5	2.30	139	16.5	143
21	Beti cikon	81.6	2.16	139	17.0	143
22	Bhushihara	70.6	2.43	146	13.2	150
23	Bhushihara	77.8	2.58	141	14.6	150
24	Bhushihara	90.6	2.54	142	14.2	150
25	Bhushihara	91.4	2.52	141	13.6	142
26	Bhushihara	92.0	2.38	152	8.5	142
27	Bhushihara	90.6	2.74	167	15.2	150
28	Bhushihara	82.8	2.85	150	10.2	150
29	Bhushihara	79.1	1.92	132	13.8	141
30	Bhusiaman	64.6	1.84	118	12.6	148
31	Bhusiara	82.6	2.42	143	14.4	152
32	Bionti monkhusi	63.3	3.14	142	14.6	152
33	Bionti monkhusi	61.6	3.04	153	15.2	152
34	Birindi	81.4	2.30	160	14.6	147
35	Bohorimota	66.4	2.02	151	12.2	149
36	Bohorimota	59.8	1.98	146	14.4	151
37	Bohorimota	83.8	2.28	142	22.2	141
38	Bolessormota	70.6	2.18	153	11.6	140
39	Bouhari	64.8	2.27	144	15.8	141
40	Bouhari	62.4	2.46	151	14.6	143
41	Bouhari	80.4	1.78	151	20.2	141
42	Boyar Bhog	76.6	2.38	145	17.0	141
43	Brindi	76.0	2.54	159	15.8	148
44	Bura montessor	68.2	2.94	144	18.6	141
45	Bushiari	70.6	2.58	151	13.8	152
46	Capshail	68.4	3.16	157	15.2	149
47	Carbirindi	62.8	2.90	137	12.2	147
48	Chabli	73.6	2.03	133	16.4	125
49	Chailni	73.2	2.56	140	11.8	147

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
50	Chaprash	65.8	2.42	168	13.7	135
51	Chapsail	74.6	3.18	149	14.8	147
52	Char birindi	64.6	3.74	154	17.5	151
53	Charulota	49.0	1.93	126	12.8	140
54	Chaulamagi	86.0	2.60	152	14.4	152
55	Chaulamagi	82.3	2.58	170	11.5	142
56	Chaulamagi	82.6	2.38	161	11.8	150
57	Chaulamagi	75.6	2.21	149	12.4	151
58	Chaulamatari	82.2	2.36	159	13.5	144
59	Chaulamatari	86.6	2.08	169	12.0	152
60	Chaynamilti	75.4	1.82	143	17.2	129
61	Chikon	65.0	2.14	153	15.6	139
62	Chinigura	50.8	2.50	157	18.4	135
63	Chinigura	52.6	3.11	146	13.8	136
64	Chinigura	52.2	2.40	142	16.4	133
65	Chinigura	64.2	3.00	158	16.0	133
66	Chinigura	52.0	3.48	145	15.0	141
67	Chinigura	50.8	3.12	152	12.6	140
68	Chinigura	50.2	3.02	151	21.8	135
69	Chinigura	54.2	2.72	145	19.4	135
70	Chinigura	53.8	2.76	152	12.0	131
71	Chinigura	65.8	2.34	159	13.8	143
72	Chinigura (sugondhi)	48.8	2.40	141	13.6	127
73	Chinikanai	51.2	3.11	156	16.2	136
74	Chinisura	72.6	1.72	137	16.8	129
75	Chor bolessor	60.4	2.34	144	14.2	147
76	Chorbolasor	57.9	1.92	148	24.3	141
77	Chorbrindi	56.2	2.08	141	15.4	131
78	Chormota	64.0	2.42	141	16.2	145
79	Chorualaha	88.8	2.50	157	14.8	142
80	Dingamoni	78.0	2.22	155	12.0	152
81	Dingamoni	72.2	2.38	140	11.2	149
82	Dingamoni	70.4	2.38	139	11.6	149
83	Dingamoni	74.1	2.32	140	11.3	149
84	Dolamota	62.4	2.38	146	13.4	127
85	Dolokchua	68.8	2.58	134	17.4	143
86	Dudh mona	79.4	2.92	158	10.4	144
87	Dudhmona	65.4	2.26	164	13.0	145
88	Dudkolom	73.8	1.84	152	13.4	135
89	Dudkolom	78.4	2.20	156	19.6	133
90	Dudkolom	93.1	2.00	145	14.8	133
91	Dudkolom	81.4	1.62	143	11.0	131
92	Dudkolom	89.6	1.62	136	14.4	130
93	Dudkolom	69.6	2.11	140	12.0	130
94	Dudkolom	63.6	1.96	158	14.4	133
95	Dudkolom	65.8	1.90	146	13.2	127
96	Dudmona	86.8	2.88	160	13.2	150
97	Dudmonor	85.0	2.72	158	12.8	152
98	Gafura	75.4	2.08	146	13.6	135
99	Garshail	72.6	2.42	152	15.4	149
100	Gashmota	81.2	2.26	152	12.6	151

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
101	Gashmota	75.4	2.30	142	12.4	150
102	Gashmota/Lalmota	80.0	2.14	145	13.4	150
103	Ghighoj	63.8	2.40	149	13.8	147
104	Ghius	53.6	3.14	142	19.4	148
105	Ghumsimota	55.4	2.53	135	15.8	145
106	Ghunshi	78.1	2.68	151	10.6	144
107	Golok khoia	88.4	3.30	151	17.5	137
108	Gondhokstore/sugondi	75.0	2.30	136	17.6	150
109	Gotamala	67.4	2.74	153	15.4	147
110	Gotasorno	59.8	1.94	123	17.4	149
111	Gugli	64.4	2.34	140	17.0	145
112	Gunchi	64.2	2.44	154	12.6	141
113	Gutishorna	73.0	1.82	162	12.8	151
114	Gyshmota	61.6	1.80	130	18.1	138
115	Gyshmota	72.2	2.90	140	14.0	141
116	Holdemota	85.0	2.65	150	13.4	150
117	Holdemota	93.0	2.64	140	12.2	150
118	Hori dhan	85.8	2.08	140	13.4	138
119	Hori dhan	51.4	1.98	151	15.6	140
120	Huglimota	62.8	2.44	147	17.4	147
121	Huglimota	54.4	2.08	134	15.4	139
122	Ikrahatia	86.0	2.22	129	15.4	147
123	IM	80.2	3.00	146	13.4	144
124	Jamrimota	58.2	2.94	157	19.1	141
125	Joyalia	94.4	2.58	152	16.8	133
126	Joyna	72.8	2.12	159	15.6	147
127	Joyna	76.8	2.34	160	13.4	147
128	Kachachikon	71.1	2.23	138	13.8	150
129	Kachamota	61.6	1.94	149	14.4	152
130	Kachamota	62.6	2.54	154	11.2	153
131	Kachamota	62.6	2.68	150	13.8	152
132	Kachamota	75.2	2.88	141	15.6	141
133	Kajolshail	76.6	1.88	144	14.4	148
134	Kajolshail	73.8	1.98	145	15.2	148
135	Kajolshail	70.8	2.30	149	14.0	140
136	Kajolshail	74.0	2.40	155	12.0	141
137	Kajolshail	75.4	1.90	144	13.2	144
138	Kajolshail	79.2	2.20	159	15.8	139
139	Kajolshail	73.4	2.06	144	13.8	144
140	Kajolshail	74.4	2.10	157	11.6	144
141	Kajolshail	80.2	2.52	161	13.6	144
142	Kajolshail	84.8	2.14	148	17.8	138
143	Kajulazira	45.0	2.34	136	18.8	144
144	Kala Madari	72.2	2.02	155	14.8	138
145	Kalakhoia	62.6	2.32	149	13.1	137
146	Kalakhoia	63.4	2.44	146	12.1	139
147	Kalakhoia	65.2	2.66	163	12.2	139
148	Kalakhoia	64.6	2.48	158	13.0	144
149	Kalakhoia	62.0	2.44	152	12.8	139
150	Kalakhoia	65.8	1.50	136	9.4	149
151	Kalakhoia	70.0	2.54	146	10.2	149

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
152	Kalakhoia	72.4	1.94	149	12.2	149
153	Kalakora	55.8	3.16	138	20.2	140
154	Kalashatia	75.2	2.20	142	16.0	142
155	kalijira	52.8	2.26	152	12.2	137
156	kalijira	48.6	2.28	160	10.3	137
157	Kalijira	50.4	2.18	143	17.2	146
158	Kalijira	50.6	2.42	146	16.4	136
159	Kalijira	75.0	2.76	345	15.4	138
160	Kalijira	54.0	2.20	145	18.0	129
161	Kalijira	53.6	2.24	129	17.0	134
162	Kalijira	56.8	2.48	143	19.4	146
163	Kalijira	58.2	2.38	140	17.2	125
164	Kalijira (sugondhi)	40.8	2.38	149	16.4	131
165	Kalizira	63.5	2.13	155	16.6	138
166	Kalo khoia	60.2	2.14	137	14.7	148
167	Kalo khoia	63.2	2.14	145	13.8	148
168	Kalogira	53.4	2.42	141	17.8	136
169	Kalojira	43.8	2.28	140	14.3	149
170	Kalomanik	80.6	2.02	155	18.6	142
171	Kalomota	71.6	2.70	151	14.8	152
172	Kalomota	65.8	2.21	145	13.6	150
173	Kalomota	75.1	2.62	138	21.2	145
174	Kalomota	47.8	2.60	131	15.8	131
175	Kamna	73.2	2.40	139	15.6	145
176	Kamranga	73.8	2.82	178	13.0	140
177	Kangarangamota	64.2	2.48	146	13.4	149
178	Kataribhog	55.0	3.22	136	15.6	129
179	Keyoramou	61.7	2.31	149	13.8	144
180	Kharamota	59.4	2.54	165	19.0	147
181	Khaya	58.8	2.14	146	19.1	149
182	Khiermonor	69.4	2.28	141	11.6	149
183	Khioz	54.8	1.68	140	16.4	138
184	Khoia	84.0	1.84	160	14.6	151
185	Kholshi	75.8	2.58	138	15.0	143
186	Khondalimota	62.5	1.98	142	13.7	147
187	Khoriamota	57.0	2.20	141	20.2	145
188	Khorni	80.1	2.40	137	17.2	147
189	Kironvola	67.6	2.90	148	20.4	129
190	Koladema	64.2	2.64	147	15.2	144
191	Kolardem	63.8	2.78	152	15.6	143
192	Kolardem	73.6	2.32	142	17.1	134
193	Komlachikon	75.2	2.38	163	16.6	152
194	Komlamota	75.8	2.34	170	13.0	152
195	Komlamota	61.1	2.33	152	13.4	153
196	Komlamota	74.8	2.20	151	12.8	149
197	Kotiagoni	81.8	2.62	168	13.2	144
198	Kotiagoni	74.8	2.04	157	14.0	152
199	Kumragoir	65.8	2.60	147	17.2	143
200	Kuriaguni	77.8	2.22	159	11.2	135
201	Kuti ogroni	68.4	2.18	150	17.4	151
202	Kutia ogroni	75.8	2.66	139	19.6	147

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
203	Kutiakon	50.8	2.84	143	20.4	135
204	Kutiakon	51.8	2.08	133	16.8	135
205	Kutiogroni	64.0	2.01	141	15.4	131
206	Kutipotnai	69.4	2.14	142	14.2	131
207	Kyoramota	83.2	2.28	135	18.4	141
208	Kyrengal mota	60.4	2.12	143	11.8	148
209	Kyrengal mota	62.4	2.46	146	15.2	147
210	Kyrengal mota	60.8	2.62	148	13.4	147
211	Kyrengal mota	68.6	1.82	136	24.2	143
212	Kyrengil	61.3	2.08	137	12.8	149
213	Kywamou	73.4	2.16	142	17.6	148
214	Lak Paikka	78.2	2.28	157	13.6	138
215	Lal pajam	74.2	2.58	161	12.8	135
216	Lalchikon	67.8	2.58	165	11.6	144
217	Lalchikon	74.4	2.52	169	13.2	144
218	Lalchikon	70.4	2.36	154	12.6	150
219	Lalchikon	78.8	2.16	145	17.6	143
220	Laldhan	90.4	2.04	156	13.0	138
221	Lalmota	78.8	3.16	143	13.4	150
222	Lalmota	77.0	3.06	158	14.4	150
223	Lalmota	73.8	3.16	153	15.4	150
224	Lalmota	67.2	2.88	159	12.3	150
225	Lalmota	71.4	2.84	146	14.6	150
226	Lalmota	62.0	2.18	144	15.2	148
227	Lalmota	62.0	2.22	138	13.1	148
228	Lalmota	61.6	2.62	136	23.2	150
229	Lalmota	77.2	2.28	142	14.6	150
230	Lalmota	68.8	3.02	152	15.4	147
231	Lalmota	61.6	2.62	154	18.0	141
232	Lalmota	55.3	2.50	140	15.6	141
233	Lalmota	62.6	2.62	141	14.0	141
234	Lalmota	56.4	2.80	140	14.2	142
235	Lalmota	62.8	2.24	143	14.4	145
236	Lalmota	74.6	3.06	144	15.2	143
237	Lalmota	79.2	2.16	144	14.2	141
238	Lalmota	66.4	2.66	145	13.2	142
239	Lalpaika	69.2	2.46	169	13.4	144
240	Local Balam	82.4	2.26	171	13.0	144
241	Lohashura	82.1	2.66	148	13.4	140
242	Lokanath	54.6	2.52	139	12.6	136
243	Lokiman	56.2	2.12	144	16.0	148
244	Lokma	63.2	2.38	154	13.0	152
245	Lokma	67.0	1.98	149	15.0	147
246	Lokma	63.0	2.72	148	18.1	143
247	Lokma	64.3	2.90	151	13.8	143
248	Lokma (kalo)	73.2	3.06	158	15.8	147
249	Lokma dhan	63.8	2.46	141	15.4	141
250	Luturmota	60.0	2.48	147	17.6	149
251	Moda	74.4	2.34	137	19.6	143
252	Mogaibeti	73.4	2.68	141	13.0	150
253	Mohini	76.2	1.64	160	15.4	135

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
254	Moisagota	81.0	2.78	147	13.6	138
255	Montesshor	69.8	2.88	151	15.6	147
256	Montesshor	68.6	2.32	148	12.2	149
257	Montesshor	64.4	2.84	154	16.5	147
258	Montesshor	76.4	2.02	140	16.1	144
259	Mota Kyora (sush)	63.4	2.84	156	12.4	143
260	Motai	74.4	2.16	149	15.0	147
261	Motai	74.8	2.20	145	16.0	143
262	Motha	82.2	2.81	141	22.4	138
263	Motha dhan	73.2	2.20	143	14.0	138
264	Mothamota	83.8	2.28	143	16.0	150
265	Mothamota	82.2	2.78	147	13.6	150
266	Mothamota	79.4	2.78	142	16.6	150
267	Mothamota	66.0	2.21	149	13.8	148
268	Mothamota	71.2	2.09	140	15.4	145
269	Mothamota	66.0	2.62	148	10.2	149
270	Mothamota	63.2	2.84	139	9.9	152
271	Mothamota	57.6	3.02	145	10.8	149
272	Mothamota	73.4	2.92	141	11.0	149
273	Mothamota	68.8	2.40	141	12.6	149
274	Mothamota	69.4	2.46	141	14.6	152
275	Mothamota	59.4	3.30	149	15.8	147
276	Mothamota	56.3	2.34	147	14.2	144
277	Mothamota	75.8	2.23	148	16.0	143
278	Moulata	89.4	2.11	142	13.4	150
279	Moulata	83.0	2.18	140	12.0	150
280	Moulata	85.6	2.46	145	14.4	151
281	Moulata	70.4	2.30	148	11.6	148
282	Moulata	72.0	1.84	138	13.4	149
283	Moulata	65.8	2.50	137	14.2	149
284	Moulata	66.6	2.28	141	13.2	149
285	Moulata	73.4	2.44	138	15.4	150
286	Moulata	79.6	2.82	158	18.2	149
287	Moulata	66.2	2.36	146	19.0	140
288	Moulta	70.8	3.14	162	14.6	147
289	Mutha dhan	86.2	3.70	149	15.0	152
290	Muthamota	66.6	2.34	145	14.4	140
291	Nakuche mota	62.6	2.70	152	24.4	141
292	Nakuchimota	71.1	2.22	149	12.0	152
293	Nakuchimota	74.8	2.76	149	10.8	152
294	Nakuchimota	71.8	2.72	152	12.4	152
295	Nakuchimota	64.6	2.42	147	17.2	148
296	Nalkosh	85.3	1.90	151	10.8	142
297	Nona Kursimota	65.6	2.18	147	18.4	145
298	Nonakhurci	72.4	2.88	152	13.4	147
299	Orgora	80.8	3.36	156	16.0	150
300	Paijam	56.4	2.38	157	12.8	144
301	Paijam	76.8	2.50	159	12.5	150
302	Pangas	76.0	1.64	174	9.5	133
303	Pangas	81.2	1.66	142	12.8	151
304	Pir banaij	83.2	2.02	143	18.8	141

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
305	Sabrimaloti	67.8	3.02	150	15.6	148
306	Sada pajam	60.6	2.38	151	14.0	144
307	Sadachikon	68.8	2.00	148	15.8	149
308	Sadachikon	71.3	2.32	148	14.6	134
309	Sadamota	65.6	2.73	146	16.5	152
310	Sadamota	56.0	2.82	150	14.8	152
311	Sadamota	63.5	2.44	142	12.8	152
312	Sadamota	75.2	2.54	146	16.0	150
313	Sadamota	79.8	2.82	149	17.2	150
314	Sadamota	83.4	2.74	145	13.4	150
315	Sadamota	86.6	2.54	148	17.6	150
316	Sadamota	64.6	2.40	150	19.0	148
317	Sadamota	61.6	2.88	151	17.3	148
318	Sadamota	58.5	2.63	147	13.8	148
319	Sadamota	74.0	2.58	152	13.0	150
320	Sadamota	76.0	2.26	142	14.6	147
321	Sadamota	60.8	3.00	146	15.4	152
322	Sadamota	69.6	2.64	146	17.2	152
323	Sadamota	65.3	2.62	149	17.2	152
324	Sadamota	63.0	3.36	141	15.0	152
325	Sadamota	56.6	2.76	148	15.2	152
326	Sadamota	65.2	1.62	141	15.1	152
327	Sadamota	62.2	2.14	139	17.6	152
328	Sadamota	61.8	2.56	148	17.0	152
329	Sadamota	60.8	2.40	151	14.2	150
330	Sadamota	61.6	2.70	161	15.0	149
331	Sadamota	67.4	2.93	144	14.2	147
332	Sadamota	66.0	2.02	141	19.6	141
333	Sadamota	90.2	2.40	135	14.2	143
334	Sadamota	69.8	2.94	148	15.6	141
335	Sadamota	74.8	3.04	145	14.0	142
336	Sahi Balam	54.0	2.84	155	11.8	144
337	Sakkorkhana	62.0	2.68	157	15.1	137
338	Sakkorkhana	66.4	3.00	164	13.6	137
339	Sakkorkhana	64.0	2.84	164	14.8	137
340	Sakkorkhana	49.4	2.68	146	21.0	135
341	Sakkorkhana	60.6	2.26	157	16.4	129
342	Sakkorkhora	74.2	2.56	168	13.8	135
343	Sakkorkhora	62.4	2.64	168	14.8	136
344	Sakkorkhora	53.0	2.88	153	16.0	142
345	Sakkorkhora	64.8	2.38	162	18.4	142
346	Sakkorkhora	43.8	2.48	151	18.6	131
347	Sakkorkhora	49.4	2.36	158	18.2	131
348	Sakkorkhora	48.2	2.19	134	11.8	134
349	Sakkorkhora	49.2	2.40	145	11.9	131
350	Sakkorkhora	46.4	2.69	146	11.4	132
351	Sakkorkhora	45.4	2.45	153	19.0	131
352	Sakkorkhora	53.4	2.14	149	16.6	131
353	Sakkorkhora	64.4	1.78	146	12.6	131
354	Sakkorkhora	45.4	1.86	134	17.0	131
355	Sakkorkhora	63.0	1.88	142	14.3	127

Sl	Designation	Seedling height (cm)	Ligule length (cm)	Plant height (cm)	Panicle /hill (No.)	Growth duration (days)
356	Sakkhorkhora	57.0	1.66	133	20.2	149
357	Shorbimaloti	74.2	2.56	164	12.2	152
358	Shornogoda	69.8	1.88	142	13.8	134
359	Shornogoda	60.2	2.18	123	14.8	144
360	Shornogoda	55.8	1.82	122	14.6	144
361	Shornogoda	56.6	2.44	125	16.8	139
362	Sobrimaloti	64.2	2.20	166	14.6	145
363	Sornomosuri	33.6	1.66	104	10.6	152
364	Tapushai	84.0	2.18	152	10.0	133
365	Thormucra	69.0	3.46	144	14.2	147
366	Tulsimala	66.2	2.38	141	16.8	145
367	Urkron	53.2	2.74	144	21.4	133
368	Vojon	40.0	2.26	111	9.4	149
369	Vojon	48.6	2.12	115	13.8	147
370	Azij IRRI	60.6	2.38	151	14.0	144
371	Balam (516)	60.2	2.18	123	14.8	144
372	Bhusihara	82.6	2.42	143	14.4	152
373	Dudhmona	79.4	2.92	158	10.4	144

PROJECT 6: F1 SEED PRODUCTION OF BRRI HYBRID DHAN5 DURING BORO 2023-24

6.1.1 F1 seed production of BRRI hybrid dhan5 during Boro 2023-24

Objective: To find out the suitability of hybrid seed production of BRRI hybrid dhan5 in Charbadna farm of BRRI R/S, Barishal

Materials and Methods: A line and R line seeds obtained from the hybrid rice division of BRRI, Gazipur. Restorer line was sown in two different dates at seven days interval and CMS line was sown nineteen days after second set of restorer line sowing. Thirty two days old seedlings were transplanted at a spacing of 15cm x 15cm (R x P) for CMS line and 30cm x20cm (R X P) for R line with row ratio 2:10 (R:A). Fertilizers @ 300: 250: 250:150: 25 Urea, TSP, MoP, Gypsum and $ZnSO_4$ were applied. Intercultural operations, irrigation, rouging, GA_3, application and supplementary pollination were performed as per need.

Result and discussion: A total of 530 kg (1.31 t/ha) hybrid seeds produced from BRRI hybrid dhan5 (Table 56). Seed set was poor due to partial synchronization. Flowering of A line was six days earlier than R line.

Table 56. Hybrid seed production of BRRI hybrid dhan5 during Boro 2023-24

Hybrid	Plant height (cm)		50% flowering dyas		PER	OCR	Yield	
	A line	R line	A line	R line	(%)	(%)	Kg/Plot	t/ha
BRRI hybrid dhan5	98	120	95	124	80	26	530	1.31

DS: R1 = 6 Dec 2023; R2 = 13 Dec 2023; A = 01 Jan 2024; DT: R = 08 Jan 2024; A = 31 Jan 2024; PER (%) = panicle exertion rate, OCR (%) = Out crossing rate.

II. PEST MANAGEMENT PROGRAM AREA

Expt. 2.1. Incidence of insect pests and natural enemies in light trap

M M Kabir, S Mia, P L Biswas, QSA Jahan and MAI Khan

Introduction

Production of rice crop in Barishal region is affected adversely by the infestation of various insect pests including rice hispa, stem borer, leaf roller etc. Both seedbed and transplanted field become infested by the major and minor insect pests causing considerable damage to rice crop. The severity and occurrance of the insect incidence vary seasonally with more infestation observed during Aman than that of Boro season.

Objectives

To create a database on the incidence pattern of insect pests and their natural enemies in Barishal region to develop a forecasting system.

Materials and methods

A light trap was set up at the east side of the Sagordi farm, BRRI, Barishal. Everyday, the light trap was switched on in the evening and switched off at dawn next day. The dead insects were collected from the light trap, sorted and recorded manually. Incidence of Insect Pests and Natural Enemies in light trap data were collected from July 2023 to June 2024 at Sagordi farm, BRRI R/S, Barishal.

Results and discussion

Appearance of insect pest was found lower than previous reporting year. The highest yellow stem borer (YSB) followed by green leafhopper (GLH), brown planthopper (BPH) and white brown planthopper (WBPH) was recorded in the reporting year. In case of natural enemy, the highest staphylinid beetle (STPB) followed by green mirid bug (GMB) and earwig (EW) was observed. Insect pest was trapped higher in the reporting year than natural enemy (Table 57).

The first peak of insect pest infestation was observed in October, November, December 2023 and January 2024 and the second peak in April, May and June 2024. Natural enemy abundance was found higher in January and February 2024. Although insect pest abundance was found throughout the reporting year but higher insect pest was observed in Boro season compared to T. Aman season.

Table 57. Insect pests and natural enemy population in the period of July 2023 to June, 2024

Insect pest	Population	Natural enemy	Population
GLH	6125	CDB	1043
WLH	1729	LBB	669
ZLH	1566	STPD	5989
BPH	2509	GMB	5016
WBPH	1845	Dam. fly	475
YSB	7890	SPD	285
DHB	356	EW	1098
RLF	905	TB	965
CW	125	**Total**	**15540**
SHG	705		

LHG	53
LHC	149
MC	326
RB	723
Total	**25006**

The first peak of insect pest infestation was observed in October, November, December 2022 and January 2023 and the second peak in April, May and June 2023. Natural enemy abundance was found higher in January and February, 2023 (Fig. 12). Although insect pest abundance was found throughout the reporting year but higher insect pest was observed in Boro season compared to T. Aman season.

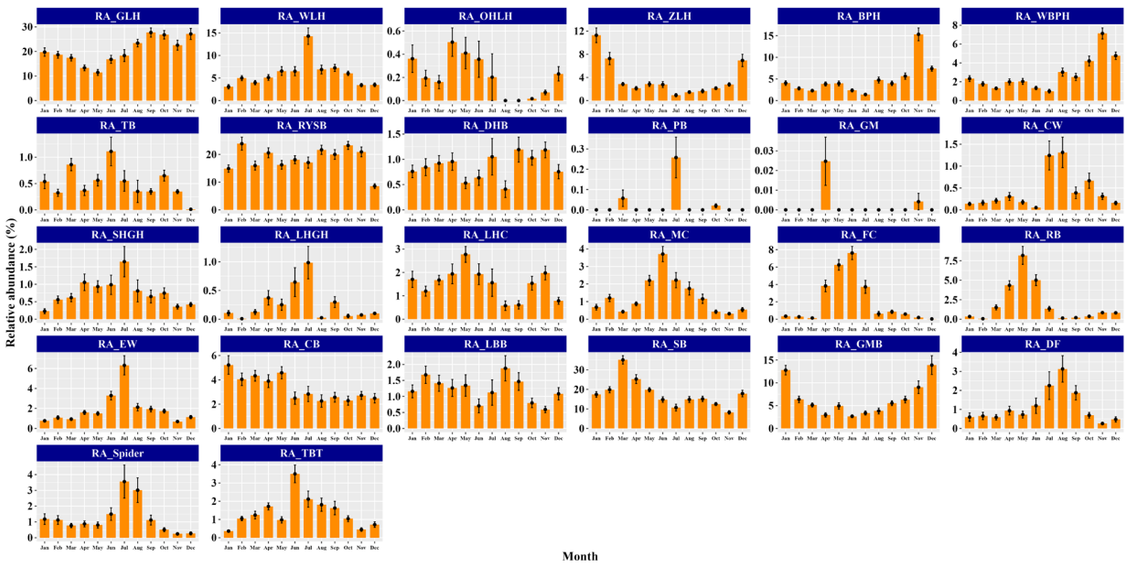


Fig.12. Month-wise relative abundance (RA of 10 years average) of beneficial and harmful insects (GLH=Green leafhopper, WLH=White leafhopper, WHLH=Orange headed leafhopper,ZLH= Zigzag leafhopper, BPH=Brown plant hopper, WBPH=White backed planthopper,TB= Tiger Bug,RYSB=Rice Yellow stemborer, DHB=Dark headed borer,PB= Pink borer, GM= Gall midge, CW=Caseworm, SHGH=Short horn grasshopper,LHGH= Long horn grasshopper, LHC=Long horn cricket, MC=Mole Cricket, FC=Field Cricket, RB=Rice bug,EW= Ear wig, CB= Carabid beetle, LBB=Lady bird beetle, SB=Staphylinid beetle, GMB=Green mirid bug,DF= Damsel fly, Spider, TBT=Tigar beetle)

Abundance of two major insects namely, yellow stem borer (YSB) and brown planthopper (BPH) was found in the reporting period and as shown in Fig. 13. YSB was found comparatively higher in Boro season than T. Aman season. Higher yellow stem borer was found in January, April, May and in June, 2023. Other side brown planthopper (BPH) was found higher in T. Aman season. In this reporting year higher no. of BPH was found in November 2023.

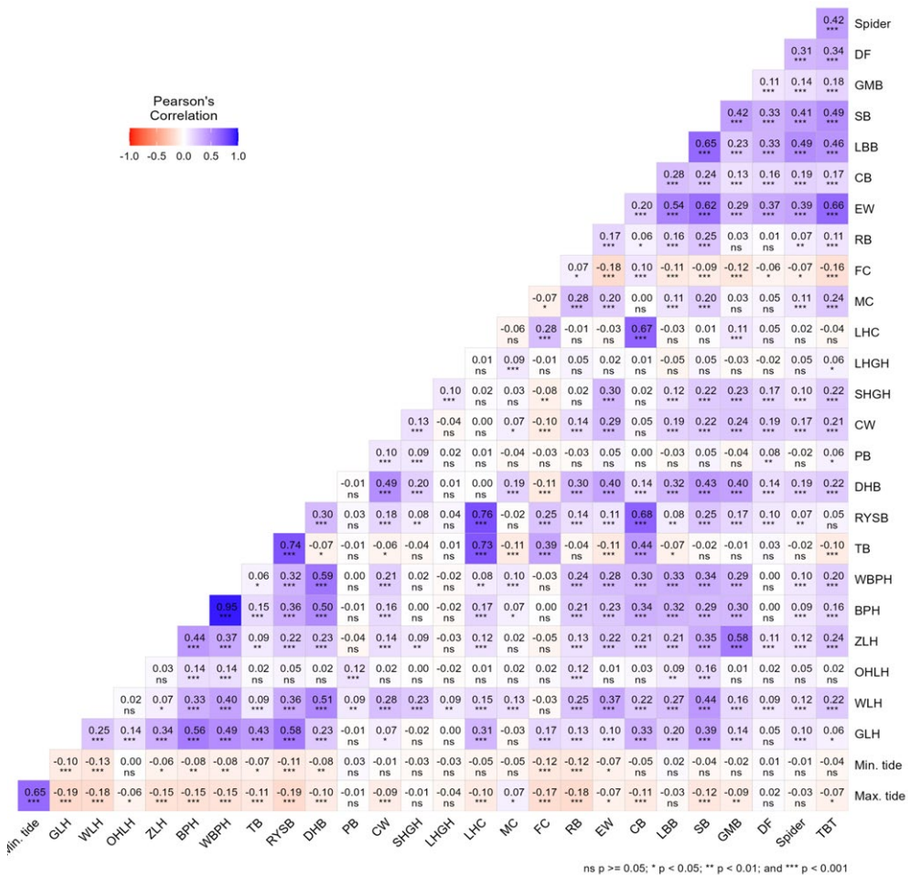


Fig. 13. Correlogram illustrating the relationship among beneficial & harmful insects and tidal height (cm)

Expt.2.2. Evaluation of new chemicals against rice blast disease

Objective:

To find out the effective chemicals suitable for Blast disease management.

Materials and Methods:

A total of 21 chemicals, including the standard check (Trooper 75WP), were evaluated for their efficacy against leaf blast at BRRI RS, Barishal, during the Boro 2023-24 season. The test variety used was US2, and inoculation was performed by spraying a spore suspension. Chemical treatments were applied twice: once 3 days before inoculation and again 3 days after inoculation. The percentage of leaf area damage was assessed visually, and disease reduction percentages were calculated in comparison to the untreated control.

Results:

Among the tested chemicals, only 10, including the check (Trooper 75WP), reduced leaf damage by more than 80% compared to the untreated control (Table 58). These chemicals will be re-evaluated during the T. Aman season for further confirmation. Those chemicals that consistently show over 80% control in both seasons will be recommended to the Plant Protection Wing, DAE, for registration.

Table 58. Evaluation of new chemicals against leaf blast, Boro 2023-24 at BRRI RS, Barishal

Sl. No	P. Path SL.	Name of Fungicide	Active Ingredients	Recommended Dose	Application dose (gm or ml / L)	Infected leaf area (%)		Disease reduction over control (%)		
						R1	R2	R1	R2	Avg. (%)
1	945	Anti-Blast 38SC	Pyraclostrobin 25 + Tricyclazole 13 SC	1ml/L	1 ml/L	10	5	88.89	94.57	91.73
2	946	Ezla 70 WP	Fenoxanil 20 % + Tricyclazole 50 %	1-1.5 gm/L	1.5 gm /L	18	15	80.00	83.70	81.85
3	950	Magbo 75 WDG	Tebuconazole 50 % + Trifloxystrobin 25 %	150-225 g/ha	0.5 gm /L	10	10	88.89	89.13	89.01
4	958	Defend 32.5 SC	Azoxystrobin 20% w/w + Difeconazole 12.5 % w/w	450-750 ml/ha	2 ml/L	30	40	66.67	56.52	61.59
5	959	Fentazol 70 WP	Fenoxanil 20 % + Tricyclazole 50 %	900-1050 gm/ha	2 gm/L	15	18	83.33	80.43	81.88
6	960	Bibar 35 SC	Azoxystrobin 200g/L + Tebuconazole 150 g/ LSC	750 ml/ha	2 ml/L	70	60	22.22	34.78	28.50
7	961	Fentazol 70 WP	Tebuconazole 50 % + Trifloxystrobin 25 %	300 gm/ha	1 gm/L	15	10	83.33	89.13	86.23
8	963	Salsa 27.11 SC	Picoxystrobin 6.78 % + Tricyclazole 20.33 %	1 L/ha	2 ml/L	50	50	44.44	45.65	45.05
9	968	Pangery Goold 1.5 Wp	Trichoderma Herzanium 15 %	5-10 gm/L	10 gm/L	60	60	33.33	34.78	34.06
10	976	Achieve 28SC	Azoxystrobin 20% + Cyproconazole 85 SC	1ml/L	1 ml/L	60	40	33.33	56.52	44.93
11	978	Platinum 75 WDG	Pyraclostrobin 60 % + Tricyclazole 15 %	300 gm/ha	0.5 gm/L	10	10	88.89	89.13	89.01
12	980	3 Star 75 WDG	Tebuconazole 50 % + Trifloxystrobin 25 %	300 gm/ha	0.5 gm/L	10	10	88.89	89.13	89.01
13	983	Blast off 75 WDG	Tebuconazole 50 % + Trifloxystrobin 25 %	300 gm/ha	0.5 gm/L	15	20	83.33	78.26	80.80
14	985	Mzole 32.5 SC	Difeconazole 12.5 + Azoxystrobin 20%	500 ml/ha	1 ml/L	25	20	72.22	78.26	75.24
15		Rice Corm 40SC		1ml/L	1 ml/L	50	50	44.44	45.65	45.05
16	986	Khajna 56 SC	Azoxystrobin 6 % + Tricyclazole 50 %	500 ml/ha	1 ml/L	30	30	66.67	67.39	67.03
17	987	Nonstop 56 SC	Azoxystrobin 6 % + Tricyclazole 50 %	500 ml/ha	1 ml/L	30	35	66.67	61.96	64.31
18	992	Samar 75 WP			6 gm/L	70	75	22.22	18.48	20.35
19	999	Hunk 28 SC	Azoxystrobin + Cyproconazole	200-800 ml /ha	2 ml/L	75	80	16.67	13.04	14.86
20	1001	Properti 40 SC	Tricyclazole + Difeconazole	300-375 ml/ha	2 ml/L	80	80	11.11	13.04	12.08
21	-	Tooper (Check)	Tricyclazole 75 %	400 gm/ha	0.8 gm/L	10	8	88.89	91.30	90.10
22	-	Disease Control	Water	-	-	90	92	0.00	0.00	0.00

Expt.2.3. Judicial application of fungicides for blast disease management under field condition (PARTNER)

Objective:
To validate BRRI developed blast management packages under field conditions

Materials and methods:
To validate and disseminate neck blast disease management practices in the Barishal region, six field trials were established at Jangalia village, Barishal Sadar Upazila, Barishal. The plots selected for experimentation were those already transplanted by farmers using their own varieties and had a history of blast infection. The effective blast control chemical Trooper 75WP (Tricyclazole 75%) was applied at a rate of 0.8 g/L of water during the heading stage and again 7 days after heading (flowering). Each plot was divided into two sections: (1) treated with the recommended chemical and (2) untreated (no chemicals applied). Data on neck blast disease incidence (%) and yield from the entire plot were collected at harvest. Disease reduction and yield advantages were calculated relative to the untreated control plots.

Results:
The treatment resulted in more than a 70% reduction in neck blast disease incidence and over a 60% increase in yield (Table 59). This study demonstrates that the blast management practices developed by BRRI effectively reduce blast disease and increase rice yield.

Table 59. Validation of neck blast disease management practices at Barishal region during Boro 2023-24

Farmer	Neck blast incidence (%)			Yield (t/ha)		
	Treated plot	Untreated plot	Disease reduction over untreated plot (%)	Treated plot	Untreated plot	Yield advantages over untreated plot (%)
F1	9.5	70.5	86.5	6.3	3.0	113.0
F2	8.5	65.5	87.0	6.6	3.1	112.6
F3	10.5	35.5	70.4	6.2	3.7	67.0
F4	12.5	40.5	69.1	5.8	3.5	64.4
F5	8.5	65.5	87.0	6.5	2.8	134.5
F6	7.5	35.5	78.9	6.6	3.6	82.3

III. CROP SOIL WATER MANAGEMENT PROGRAM AREA

Expt.3.1. Management of nitrogen nutrition of HYV rice during Aman season under tidal flood situation

M S Rahman, S Mia, Q S A Jahan and MAI Khan

Objective:

To find out the effective way of nitrogenious fertilizer management in HYV during Aman season under tidal flood situation.

Materials and Methods:

The experiment was conducted to determine a suitable urea application method for Aman rice cultivated under tidal flood conditions. The experiment was conducted in Char Badna farm, BRRI Barishal, during T. Aman 2023. The treatments included the following five urea application methods: (1) prilled urea (PU): 2 splits (½ at 10 DAT + ½ at 7d before PI), (2) PU: 3 splits (1/3rd at 10 DAT + 1/3rd at active tillering + 1/3rd seven days before panicle initiation), (3) PU: full dose as basal, 4) PU: full dose after final recession of flood water, and 5) urea deep placement (UDP) (@10 DAT). In treatments 1 and 2, the application of urea was carried out in between the flood water recession and new water entry periods during the high tides in full moon and new moon. The design of the experiment was factorial RCB with three replications, with the factors being i) variety and ii) urea application methods. The varieties were BRRI dhan52 (145 d) and BRRI dhan76 (165 d). The N application rate was 95 kg/ha. Other nutrients e.g., P-K-S-Zn were applied on soil test basis as a flat dose (10-65-11-2 kg/ha).

Results and Discussion:

Results showed that the application of PU @ 3 splits yielded the highest grain for both varieties (Fig. 14). The full dose of PU as basal, recorded the lowest grain yield indicating a greater loss of the applied fertilizer. A varietal difference was recorded in response to urea application, with BRRI dhan76 being more responsive to late urea applications than BRRI dhan52. Deep urea placement yielded higher grain in shorter duration variety BRRI dhan52, than in BRRI dhan76 with longer duration (Fig.14). Further investigation will confirm the findings.

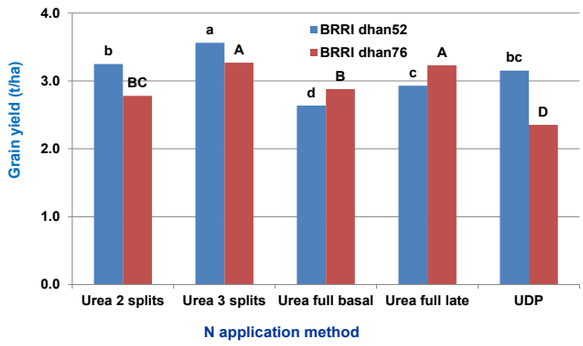


Fig. 14. Effect of urea application method on the grain yield of HYV rice in Char badna farm, BRRI Barishal, T. Aman 2023.

Expt.3.2. Effect of planting date on the growth and yield of newly developed BRRI varieties in Barishal region

S Mia, MAI Khan and MS Islam

Introduction

Planting time is an important factor for rice production. Due to late or early planting rice production may be reduced drastically. For finding out the optimum planting time at T. Aman2023 and Boro2023-24 season in Barishal region, this experiment has conducted.

Objectives:

To find out the suitable time of planting of different popular varieties of BRRI in Barishal.

Materials and methods

The experiment was conducted in Char Badna farm in T. Aman2023 season and Sagordi farm in boro2023-24 season of BRRI R/S, Barishal aimed at identifying a suitable planting date for short and long durationT. Aman and Boro rice cultivars to maximize grain yield. In case of T. Aman2023 season the selected cultivars were soaked from 10 June to 10 August and 25-30 days old seedlings were transplanted. On the other hand, in Boro2023-24 season the selected cultivars were soaked from 1November to 16 January and 35-45 days old seedlings were transplanted. The design of experiment was split plot with three replications. In both season, 3 short duration varieties (T.Aman season:BRRI dhan75, BRRI dhan87, BRRI dhan90 and Boro season: BRRI dhan101, BRRI dhan88, BRRI dhan96) and 3 long duration varieties (T.Aman season:BRRI dhan49, BRRI dhan52, BRRI dhan93 and Boro season: BRRI dhan102, BRRI dhan89, BRRI dhan92) were tested. Fertilizer and other management practices were accomplished by follwing BRRI recommendation. Yield and yield components data were collected following standard method. The data were analyzed following the STAR software.

Result and discussion

T.Aman2023

The results showed that the short duration varieties BRRI dhan75, BRRI dhan 87 and BRRI dhan90 seeding 25 June produced higher grain (2.73 t/ha, 3.63 t/ha, 2.49 t/ha respectively) than the delayed transplanting (Table 60). In case of long duration varieties BRRI dhan49, BRRI dhan93 seeding on 25 June gave better yield (3.40t/ha, 3.43t/ha respectively) and BRRI dhan 52 higher yielded at 10 Jully seeding (Table 61).

Table 60. Effect of time of planting on yield growth duration (GD) of short duration varieties during T.Aman2023 at BRRI farm, Char Badna, Barisal.

	Yield(t/ha)					GD(days)				
DS variety	10-Jun	25-Jun	10-Jul	25-Jul	10-Aug	10-Jun	25-Jun	10-Jul	25-Jul	10-Aug
BRRI dhan75	1.65	2.73	2.46	1.87	2.22	122	121	106	107	107
BRRI dhan87	2.41	3.63	2.58	2.77	3.36	125	137	122	118	126
BRRI dhan90	0.33	2.49	2.19	1.10	2.43	132	125	111	107	107
CV(DT)%	8.82					0.2183				
CV(Variety)%	7.16					0.2183				
LSD(0.05)	0.2782					0.4398				

Table 61. Effect of time of planting on yield growth duration (GD) of long duration varieties during T. Aman 2023 at BRRI farm, Char Badna, Barisal.

	Yield (t/ha)					GD (days)				
DS Variety	10-Jun	25-Jun	10-Jul	25-Jul	10-Aug	10-Jun	25-Jun	10-Jul	25-Jul	10-Aug
BRRI dhan49	1.84	3.40	2.89	2.78	2.74	136	134	125	117	119
BRRI dhan52	2.24	3.45	3.57	2.63	2.94	140	134	125	117	127
BRRI dhan93	3.10	3.43	3.12	2.46	3.14	140	136	127	118	127
CV(a)%	7.41					0.3813				
CV(b)%	8.06					0.3944				
LSD(0.05)	0.4					0.861				

Boro 2023-24

The results showed that the short duration varieties BRRI dhan88 and BRRI dhan101 seeding on 1 December produced higher grain yield (6.95 t/ha, 8.08 t/ha respectively) and BRRI dhan 96 showed better yield on 1 January seeding (Table 62). In case of long duration varieties BRRI dhan89, BRRI dhan92 and BRRI dhan102 performed better yield (7.23 t/ha, 7.45 t/ha and 8.27 t/ha respectively) on 16November seeding (Table 63).

Table 62. Effect of time of planting on yield and growth duration (GD) of short duration varieties during Boro2023-24 at BRRI farm, Sagordi, Barisal.

	Yield(t/ha)						**GD(days)**					
Variety	01-Nov	16-Nov	01-Dec	16-Dec	01-Jan	16-Jan	01-Nov	16-Nov	01-Dec	16-Dec	01-Jan	16-Jan
BRRI dhan 101	5.30	7.20	8.08	6.55	4.51	0.00	171	158	148	144	134	125
BRRI dhan88	5.52	6.43	6.95	6.76	6.12	4.84	159	152	140	126	133	116
BRRI dhan96	5.51	7.11	7.30	6.59	7.61	4.98	161	152	143	130	133	116
CV(a)%	9.01						0.308					
CV(b)%	7.22						0.4822					
LSD(0.05)	0.7259						1.1466					

Table 63. Effect of time of planting on yield and growth duration (GD) of long duration varieties during Boro2023-24 at BRRI farm, Sagordi, Barisal.

	Yield(t/ha)						GD (days)					
Variety	1-Nov	16-Nov	1-Dec	16-Dec	1-Jan	16-Jan	1-Nov	16-Nov	1-Dec	16-Dec	1-Jan	16-Jan
BRRI dhan102	7.64	8.27	6.95	5.05	3.50	0.23	177	160	157	146	141	148
BRRI dhan89	5.81	7.23	6.75	6.73	2.61	0.217	175	160	158	147	145	163
BRRI dhan92	6.15	7.45	6.39	4.70	1.93	1.713	175	161	156	148	148	163
CV(a)%	7.2						0.5799					
CV(b)%	5.68						0.4543					
LSD (0.05)	0.4754						1.2026					

Expt.3.3. Long-term missing element experiment for diagnosing limiting nutrient in tidal wetland soil

S. Mia and MAI Khan

Introduction

Proper identification and management of nutrient deficiency in soils are a prerequisite for sustaining higher yields over long period of time. The missing element trial is an effective field technique to identify the existence of limiting nutrient(s) in soil of a particular area for its correction and management. The experiment was conducted to find out the soil nutrients that limit rice production in tidal soil in Sagardi, Barishal.

Materials and methods

The trial was initiated in a permanent layout at Sagardi farm, BRRI R/S, Barishal during Boro 2009 with six treatments, namely NPKSZn, -N (PKSZn), -P (NKSZn), -K (NPSZn), -S (NPKZn) and –Zn (NPKS) in RCB design with four replications. In 2022-23, the fertilizer rate was N-P-K-S-Zn @ 95-6-65-11-2 kg/ha in T. Aman and 175-25-35-15-1.5 kg/ha in Boro season. The test varieties were BRRI dhan76 in T. Aman and BRRI dhan74 in Boro. Grain yield was recorded from 5 m^2 area at 14% moisture content. Data were subject to statistical analysis and mean separation were done by DMRT using STAR software.

Results and discussion

T. Aman 2023: The results of nutrient omission effect on the grain yield of rice are presented in Table 64. During T. Aman2023, the highest grain yield (5.89 t/ha) of BRRI dhan76 was observed in the complete treatment in which recommended rates of N, P, K, S, and Zn fertilizer were applied. Grain yield was significantly lower than the complete treatment due to the omission of N (diff. 1.62 t/ha) but in case of ommision of other nutrient no significant different were found (Table5). The finding also supports the fact that during T. Aman season the silt deposition from the tidal water enriches the fertility of soil. The lowest yield was recorded in –N plot followed by –K plot. Thus, it is observed from the yield data that recommended doses of N nutrient should be applied during T. Aman season to obtain optimum yield of BRRI dhan76 and to maintain soil nutrient levels in Sagardi farm soil.

Table 64. Effect of long-term omission of nutrient elements on the yield of BRRI dhan76 and BRRI dhan89 during T. Aman 2023 and Boro 2023-24 at BRRI farm, Sagordi, Barishal.

	Grain Yield(t/ha) *	
Treatment	T. Aman (BRRI dhan76)	Boro (BRRI dhan74)
NPKSZn	5.89a	6.62a
(-N)	4.27b	4b
(-P)	5.82a	6.15a
(-K)	5.41a	6.3a
(-S)	5.6a	6.6a
(-Zn)	5.49a	6.02a
CV(%)	5.24	8.11

*Means followed by same letter in a column are not significantly different.

Boro 2023-24: Grain yield of BRRI dhan74 ranged from 4 to 6.62 t/ha during Boro 2023-24 (Table 64). Unlike T. Aman season, a significant decrease (diff. 2.62 t/ha) in grain yield of BRRI dhan74 was observed only in the N omission plot during Boro season. Grain yield of the other treatments (with nutrient omission) showed statistically similar to the complete fertilizer but omission of K a high difference of grain yield observed. Thus, the study revealed that for BRRI dhan74, nitrogen (N) is the most limiting nutrient in Boro season in the tidal flooded soil.
Overall findings suggest that all the nutrients (N and K) should be applied in required amount in T. Aman while in Boro, application of N must be ensured for optimum rice yield.

Expt.3.4. Study on Site Specific and Cost -Effective Integrated Weed Management (IWM) Techniques for Modern Rice Varieties in Barishal Region.

Introduction:

Integrated Weed Management (IWM) involves the use of multiple weed control strategies, including cultural, mechanical, biological, and chemical methods, to manage weeds in a holistic and environmentally friendly way. In Barishal region, cost effective and site-specific weed management technology is inadequate for farmers at boro season. Due to weed infestation at rice field the farmers don't get desire rice yield and a large yield gap is created. If herbicide used judiciously and according to label instructions, herbicides can be an effective and cost-efficient weed control method. However, it is important to choose the right herbicide for the specific weed species and to avoid overuse or misuse, which can lead to herbicide resistance and environmental damage.

Considering the above conditions, the experiment has undertaken with the following objectives

Objectives:

1. To evaluate the cost-effective integrated weed management techniques;
2. To find out an easy and site-specific weed management technique.

Materials and methods:

The experiment was conducted at Sagordi farm of BRRI regional station, Barishal during Boro2023-24 season and Sagordi farm in boro2023-24 season of BRRI R/S Barishal aimed at identifying a cost-effective weed management practice. The single factor experiment consisted of 7 weed management practices namely T_1: Control (No weeding + No herbicide) ,T_2: Weed free (as much HW needed ,T_3: Pre-emergence herbicide+ Post-emergence herbicide,T_4: Pre-emergence herbicide + 1 Hand Weeding (HW) at 35-40 Days after transplanting (DAT):,T_5: Post-emergence herbicide + 1HW at 40-45DAT
T_6: 2HW (1st at 15-20DAT and 2nd at 40-45 DAT) and T_7: Mechanical weeding by BRRI weeder(1st at 15-20DAT) + 1 HW at 35-40 DAT). In this study as pre-emergence herbicide, Pretilachlor50%EC (Rifit500EC), and post-emergence herbicide, Bensulfuron-Methyl12%+ Bispyribac Sodium18% WP(Cross-out30wp) were used according to recommended dose. BRRI dhan74 was tested in this experiment. The experiment was accomplished by following RCB design with 3 replications. Fertilizer and other management practices were accomplished by following BRRI recommendation. Yield

and yield components data were collected following standard method. The data were analyzed following the STAR software.

Result:

This study found that the rice grain yield was affected by the weed control treatment and there had a massive difference in weeding cost difference among the treatments (Fig.1). The highest grain yield (8.61t/ha) was recorded in the treatment Post-emergence herbicide + 1HW at 40-45DAT followed by T_4: Pre-emergence herbicide + 1 Hand Weeding (HW) at 35-40 DAT(7.99t ha^{-1}) and T_7: Mechanical weeding by BRRI weeder(1^{st} at 15-20DAT) + 1 HW at 35-40 DAT (7.85t ha^{-1}) . The lowest yield(4.02 t ha^{-1}) was recorded in the treatment T_1: Control (No weeding + No herbicide) .

In case of cost, highest (48,333Tk.) weed control treatment is T_2: Weed free (as much HW needed followed by T_6: 2HW ;1^{st} at 15-20DAT and 2^{nd} at 40-45 DAT (34,456Tk.) and T_7: Mechanical weeding by BRRI weeder at 15-20DAT + 1 HW at 35-40 DAT (30,040Tk.). The lowest cost (0Tk./ha) weed control was estimated from T_1: Control (No weeding + No herbicide) followed by T_3: Pre-emergence herbicide+ Post emergence herbicide (4,477 Tk./ha), T_5: Post-emergence herbicide + 1HW at 40-45DAT (7,320Tk./ha) and T_4: Pre-emergence herbicide + 1 Hand Weeding (HW) at 35-40 DAT (8,633 Tk./ha).

On the basis of above result, it can be concluded that T_5: Post-emergence herbicide + 1HW at 40-45 DAT is the most cost effective and efficient weed management practice.

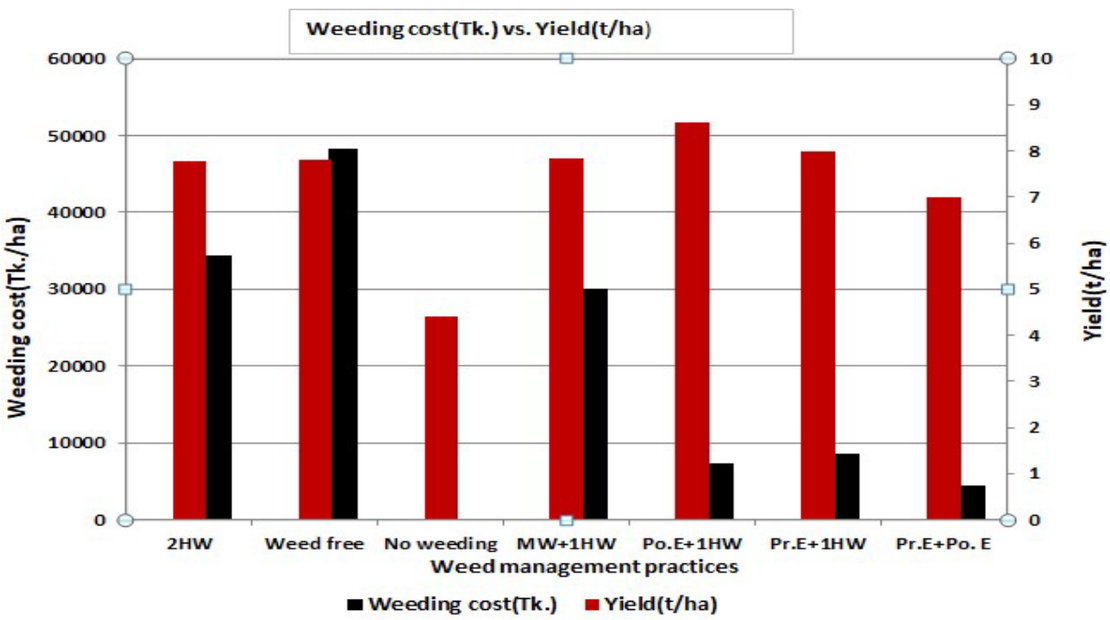


Fig.15. Cost and effect of different weed management practices on yield of rice at Barishal region (HW=Hand weeding, MW= Mechanical weeding, Po. E= Post-emergence herbicide, Pr. E=Pre-emergence herbicide)

Expt. 5.4. Exploring sediment deposition from tidal water in Barishal regional station.

S Mia and MAI Khan

Introduction

Huge quantity of sediment deposits in the rivers, canals and agricultural fields through tidal water in Southern tidal region. Sediment is a blessing for farmers as it is enriched with nutrients. Farmers in Barishal region use less fertilizer than any other region in Aman season since the lands receive huge quantities of silt deposits from tidal flood. The quality and rate of sediment deposition differ from season to season.

Objectives

1. To find out the organic and inorganic (nutritional) elements beneficial for plants in deposited silt.
2. To find out the sediment deposition rate in agricultural land in Barishal Regional station.

Materials and methods

Tidal water with sediment samples flow was trapped from fixed points in Sagradi farm, Barishal. A pot was fixed in the experimental field. After a high tide and low tide, the pot was brought from the land and kept in the room for further deposition. After completion of the deposition, supernatant water was removed and the pot was kept for drying in room temperature. For the elemental analysis of the dried sediment, the sample was stored and sent to Soil Resource Development Institute (SRDI), Barishal.

Results

Results showed that the good quality of sediment with plant nutrients indicated that the soils of the farm were enriched and nutrient status of sediment is higher than normal soil (Table 6). pH and salinity of sediment is higher (0.48 and 0.25DS/m respectively) than soil. Organic matter, N, P, K, S and Zn content is higher in sediment than soil (Table 65).

Table 65. Nutrient quality of sediments and soil of Sagardi Farm, Barishal in 2023-24.

Sample category	**pH**	**Salinity**	**Organic matter**	**Nitrogen**	**Potassium**	**Phosphorus**	**Sulphur**	**Zinc**
		(EC) (ds/m)	(%)	(%)	(me%)	(µg g^{-1})	(µg g^{-1})	(µgg^{-1})
Sediment	7.45	2.16	4.21	0.2105	55.25	0.57	13.05	4.285
Soil	6.97	1.91	2.45	0.12	17.47	0.28	11.53	2.12

Every year the addition of tidal sediments makes the farm fertile during Aman season. Thus, the supplementation of nutrients by tidal sediments may reduce the requirement of huge fertilizer for T. Aman rice in the tidally flooded areas of the country. The experiment needs to be continued to draw a final conclusion.

IV. SOCIO ECONOMIC AND POLICY PROGRAM AREA

Expt 4.1: Stability analysis of BRRI released variety in 2023-24

Suhel Mia and MAI Khan

Introduction: BRRI has been developing high yielding and modern rice cultivars to address the on-farm demand in different agro-climatic condition since 1970. Accordingly, BRRI has released a series of high yielding rice cultivars. It is necessary to know the adaptability of those cultivars whether they are suited to a particular environment. Therefore, this study was conducted for finding out the suitable rice cultivars in Barishal region.

Objectives: The objective was to find out the suitable Aus, Aman and Boro rice cultivars in Barishal region.

Aus 2023

Study was accomplished at Charbadna farm, BRRI regional station, Barishal during Aus, 2023. Fourteen (14) BRRI released varieties were tested following RCB design with three replications (Table 1). Size of unit plot was 3m x3 m, plot to plot distance was 40 cm, block to block distance was 60 cm and spacing was 20 × 20 cm. Twenty-seven days old seedlings were transplanted. Crop management practices were done according to BRRI recommended practice. Among the tested 14 varieties BRRI dhan98 gave highest yield (5.33 t/ha) followed by BRRI dhan48 (4.57 t/ha) and BRRI dhan26(4.39 t/ha). The lowest yield was observed in BRRI dhan106 (3.1 t/ha) (Table 66).

Table 66. Stability analysis of BRRI released variety in Aus 2023

Variety	GD (days)	Yield (t/ha)
BR21	112cde	3.52defg
BR24	113cd	3.79cde
BR26	117b	4.39b
BRRI dhan106	127a	3.1g
BRRI dhan27	119b	3.6defg
BRRI dhan42	110de	3.7def
BRRI dhan43	110e	3.14fg
BRRI dhan48	117b	4.57b
BRRI dhan65	111cde	3.76cde
BRRI dhan82	112cde	3.46efg
BRRI dhan83	118b	4.33bc
BRRI dhan85	113c	4.07bcd
BRRI dhan98	117b	5.33a
BRRI hybrid dhan7	127a	4.1bcd
CV(%)	0.9303	5.03

*Values followed by the same letter are not significantly different.
D/S: 11/04/2023 D/T: 8/05/2023

T. Aman 2023

During T. Aman 2023, forty-eight (48) BRRI released varieties were tested in three groups, namely, short duration (15 nos), medium duration (22 nos) and long duration (11 nos) (Tables 67-69).

Among the tested short duration varieties, the highest yield was observed in BRRI dhan95 (4.06 t/ha) followed by BRRI dhan87 (3.4 t/ha), BRRI dhan71 (2.69 t/ha) and BRRI dhan53 (2.64 t/ha). The lowest yield was found in BRRI dhan62 (0.75 t/ha) (Table 67). In medium duration varieties, the highest yield was found in BRRI dhan49 (3.91 t/ha) followed by BRRI dhan54 (3.87 t/ha), and BRRI dhan103 (3.85 t/ha). The lowest yield was observed in BR3 (1.41 t/ha) (Table 68). Finally, in the long duration varieties, the highest yield was in BRRI dhan91 (3.49 t/ha) followed by BR10 (2.44 t/ha) and the lowest yield was in BRRI dhan37 (1.14 t/ha) (Table 69).

Table 67. Stability analysis of BRRI released short duration variety in T. Aman, 2023

Variety	GD (days)	Yield (t/ha)
BRRI dhan33	105cd	2.05cde
BRRI dhan39	108b	1.52def
BRRI dhan53	108bc	2.64bcd
BRRI dhan56	108bc	1.89cde
BRRI dhan57	106bcd	1.74cdef
BRRI dhan62	103d	0.75f
BRRI dhan66	108bc	2.11cde
BRRI dhan71	108b	2.69bc
BRRI dhan73	108b	2.04cde
BRRI dhan75	106bcd	1.77cdef
BRRI dhan87	122a	3.4ab
BRRI dhan90	108bc	2.02cde
BRRI dhan95	122a	4.06a
BRRI hybrid dhan4	108bc	1.86cdef
BRRI hybrid dhan6	104d	1.42ef
Cv(%)	1.02	17.58

*Values followed by the same letter are not significantly different.
D/S: 11/07/2023 D/T: 09/08/2023

Table 68. Stability analysis of BRRI released medium duration variety in T. Aman, 2023

Variety	GD (days)	Yield (t/ha)
BR11	127b	3.03abcdef
BR25	123ef	3.42abcd
BR3	123ef	1.41g
BR4	130a	3.39abcd
BRRI dhan103	122f	3.85ab
BRRI dhan30	130a	3abcdef
BRRI dhan31	126bc	2.13fg
BRRI dhan32	123ef	2.41defg
BRRI dhan40	130a	3.79ab
BRRI dhan44	127b	3.31abcde
BRRI dhan49	123ef	3.91a
BRRI dhan51	130a	3.82ab
BRRI dhan52	125cd	3.35abcde
BRRI dhan54	123ef	3.87a
BRRI dhan70	124de	2.66cdef
BRRI dhan72	123ef	2.77bcdef
BRRI dhan77	127b	2.29efg
BRRI dhan78	123ef	2.98abcdef
BRRI dhan79	123def	3.49abcd
BRRI dhan80	123ef	3.55abc
BRRI dhan93	130a	3.65abc
BRRI dhan94	130a	3.75ab
CV(%)	0.5032	10.88

*Values followed by the same letter are not significantly different.

D/S: 11/07/2023 D/T: 09/08/2023

Table 69. Stability analysis of BRRI released long duration variety in T. Aman, 2023

Variety	GD(days)	Yield(t/ha)
BR10	137bc	2.44b
BR22	145a	2.19bc
BR23	129d	1.59de
BR5	136c	1.23e
BRRI dhan34	145a	1.49de
BRRI dhan37	139b	1.14e
BRRI dhan38	137bc	1.76cd
BRRI dhan41	137bc	1.26e
BRRI dhan46	118f	2.24b
BRRI dhan76	130d	1.46de
BRRI dhan91	125e	3.49a
CV(%)	0.5557	8.81

*Values followed by the same letter are not significantly different.

D/S: 11/07/2023 D/T: 09/08/2023

Boro 2023-24

Fifty-two (52) varieties were evaluated at Charbadna, Barishal during Boro 2023-24. The varieties were tested in two groups, namely short duration (26 nos.) and long duration (26 nos.) (Tables 70 and 71).

Among the tested short duration varieties, the highest yield was observed in BRRI dhan74 (5.21 t/ha) followed by BRRI dhan84 (5.15 t/ha) and BRRI dhan36 (5.08 t/ha). The lowest yield was found in BR6(3.95 t/ha) (Table 70). In case of the long duration varieties, the highest yielder was

BR17(4.86 t/ha) followed by BRRI dhan58 (4.74 t/ha) and BRRI dhan99 (4.55 t/ha). The lowest yield was observed in BRRI dhan50 (3.47 t/ha) (Table 71).

Table 70. Yield and ancillary characters of short duration genotypes, Boro 2023-24.

Variety	GD(days)	Yield(t/ha)
Bangabandhu dhan100	144de	4.28bcdef
BR1	148a	3.95ef
BR26	148a	4.08def
BR6	144de	3.95f
BRRI dhan101	148a	4.98ab
BRRI dhan104	149a	4.23cdef
BRRI dhan105	148a	4.36bcdef
BRRI dhan27	148a	4.34bcdef
BRRI dhan28	145cde	4.37bcdef
BRRI dhan36	145cde	5.08a
BRRI dhan45	145cde	4.17def
BRRI dhan55	145cde	4.65abcdef
BRRI dhan61	147ab	4.52abcdef
BRRI dhan63	144de	4.34bcdef
BRRI dhan67	148a	4.88abc
BRRI dhan68	146bcd	4.57abcdef
BRRI dhan74	148a	5.21a
BRRI dhan81	144de	4.09def
BRRI dhan84	144de	5.15a
BRRI dhan86	143e	4.96ab
BRRI dhan88	144de	4.14def
BRRI dhan96	146bc	4.2cdef
BRRI hybrid dhan2	148a	4.57abcdef
BRRI hybrid dhan3	149a	4.03ef
BRRI hybrid dhan5	144de	4.66abcde
BRRI hybrid dhan8	148a	4.77abcd
CV(%)	0.3728	4.98

*Values followed by the same letter are not significantly different.
D/S: 25/11/2023 D/T: 09/01/2024

Table 71. Yield and ancillary characters of long duration genotypes, Boro 2023-24, Barishal.

Variety	GD(days)	Yield(t/ha)
BR12	164abcd	3.81efghi
BR14	160fg	4.04defghi
BR15	165ab	3.68ghi
BR16	163bcde	3.75fghi
BR17	158gh	4.86a
BR18	162cdef	3.59hi
BR19	164abcd	4.54abcd
BR2	165ab	4.13cdefgh
BR3	164abcd	4.65abc
BR7	162def	4.3abcdef
BR8	164abc	4.43abcd
BR9	165ab	4.34abcde
BRRI dhan102	165ab	3.78efghi
BRRI dhan29	164abcd	4.14cdefgh
BRRI dhan35	162cdef	4defghi
BRRI dhan47	157hi	4.21bcdefg

Variety	GD(days)	Yield(t/ha)
BRRI dhan50	161ef	3.47i
BRRI dhan58	161ef	4.74ab
BRRI dhan59	156hi	4.36abcde
BRRI dhan60	155i	4.35abcde
BRRI dhan64	158gh	4.33abcdef
BRRI dhan69	158gh	4.47abcd
BRRI dhan89	162cdef	4.33abcdef
BRRI dhan92	163bcde	4.47abcd
BRRI dhan97	160fg	4.29abcdef
BRRI dhan99	166a	4.55abcd
CV(%)	0.4911	4.4

*Values followed by the same letter are not significantly different.
D/S: 25/11/2023 D/T: 09/01/2024

V. RICE FARMING SYSTEMS

Exp. 5.1. Suitable varietal combination for Fallow-T.Aus-T.Aman cropping pattern in Barishal region.

- In Barishal region, *Aus* cultivation is remarkable in Barguna, Patuakhali, Jhalokathi and Bhola district following Fallow-*Aus*-T. *Aman* cropping pattern
- Due to tidal surge and rainfed ecosystem farmers cultivated *Aus* and *Aman* in large area than *Boro* in these districts.
- Tepu IRRI, Abdul Hye, Monsur IRRI, Gotaillya IRRI, Kalisaitta, Sri Balam, BR21, BR26, BRRI dhan27, BRRI dhan42, BRRI dhan43, BRRI dhan48, BRRI dhan55 are cultivated over years.
- Farmers practice direct seeded, transplant, dribbled and in some extent PTOS for Aus cultivation.
- Recently, BRRI released some modern Aus varieties which yield is much higher than cultivated local variety and growth duration is earlier to some local variety.

Results:

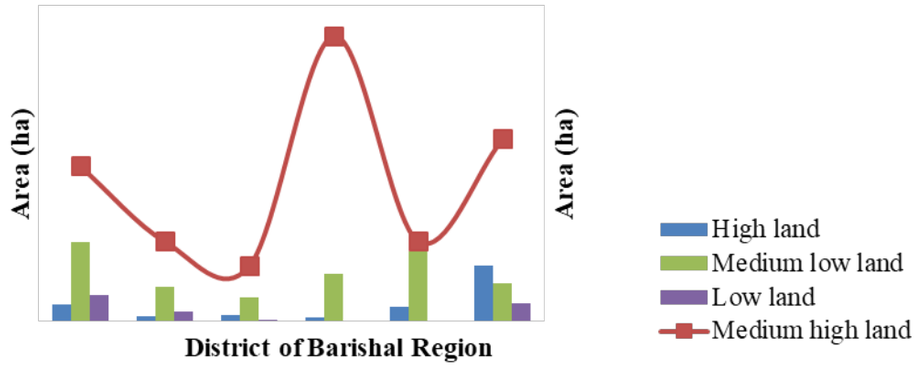
In Barishal region, *Aus* cultivation is remarkable in Barguna, Patuakhali, Jhalokathi and Bhola district following Fallow-*Aus*-T. *Aman* cropping pattern. Due to tidal surge and rainfed ecosystem farmers cultivated *Aus* and *Aman* in large area than *Boro* in these district. Tepu IRRI, Abdul Hye, Monsur IRRI, Gotaillya IRRI, Kalisaitta, Sri Balam, BR21, BR26, BRRI dhan27, BRRI dhan42, BRRI dhan43, BRRI dhan48, BRRI dhan55 are cultivated over years. Farmers practice direct seeded, transplant, dribbled and in some extent PTOS for Aus cultivation. Recently, BRRI released some modern Aus varieties which yield is much higher than cultivated local variety and growth duration is earlier to some local variety.

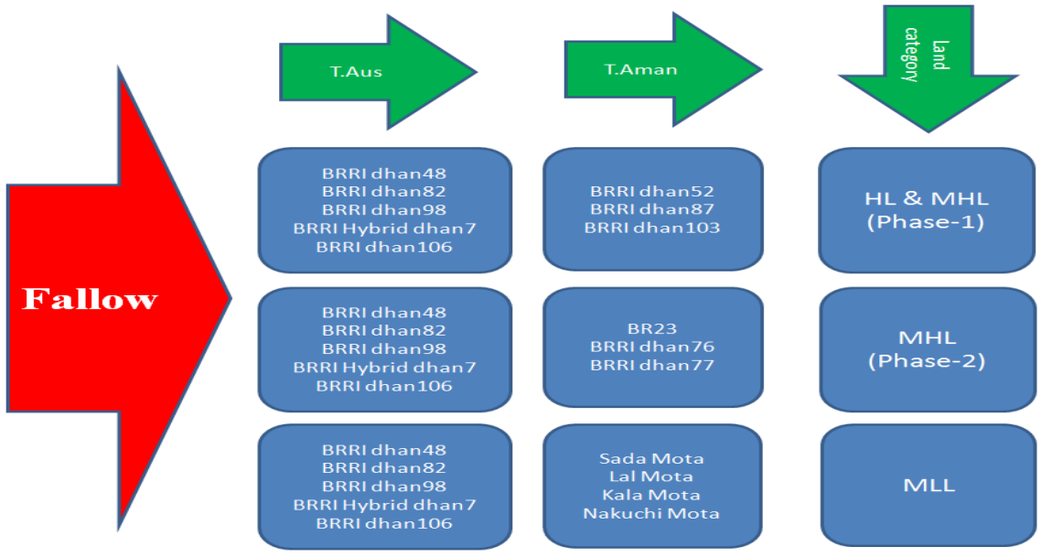
In Aus 2023, Four newly released variety BRRI dhan82, BRRI dhan98, BRRI dhan106 and BRRI Hybrid dhan7 was evaluated in this pattern. BRRI dhan106 was found highest yield provider variety followed by BRRI dhan98 and BRRI Hybrid dhan7. BRRI dhan106 out yielded 11.7% over the yield of BRRI dhan48.

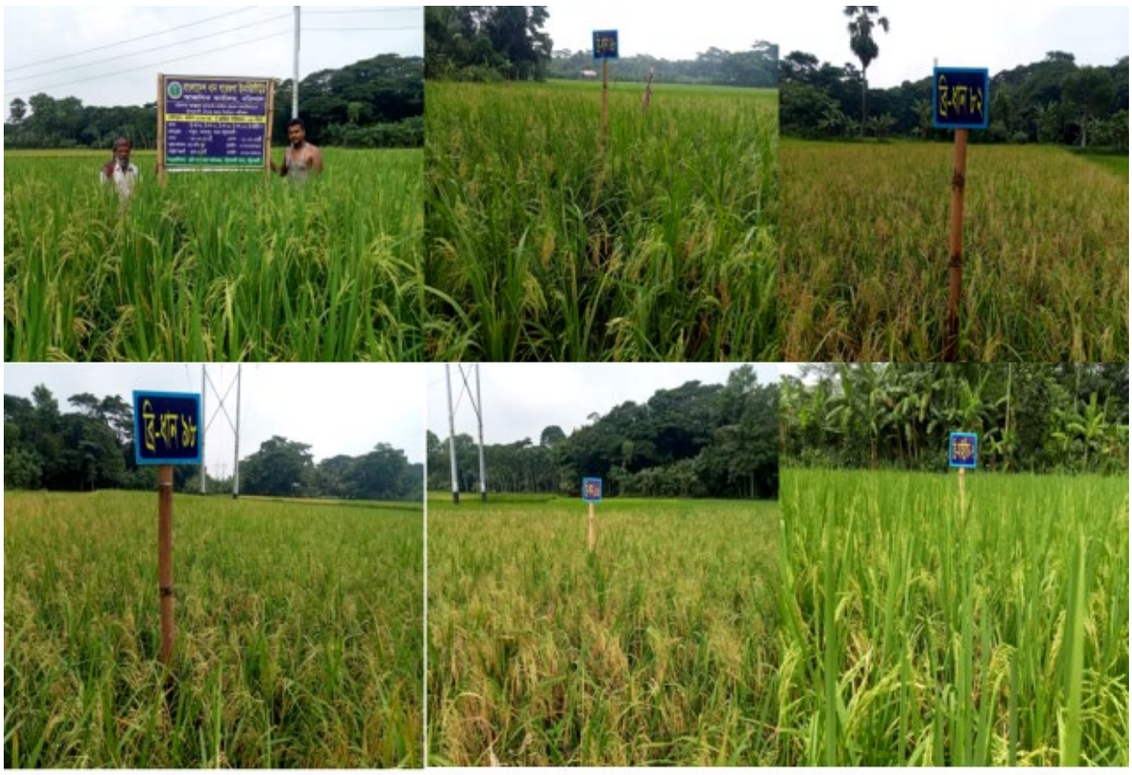
In Aman 2023, Considerd four land type (high land, medium high land: Phase-1, Medium high land: Phase-2, Medium low land) in Barishal region varieties were evaluated in four clusters.

In respect of productivity of this pattern,

BRRI dhan98+BRRI dhan103 produced highest total yield 11.87 t/ha in High land, BRRI dhan106+BRRI dhan52 produced highest total yield 11.21 t/ha where BRRI dhan106+BRRI dhan23 produced highest total yield 10.26 t/ha in medium high land: Phase-2 and in medium low land, Aus eastablishtmet was not done due to heavy tidal surge, here Nakuchi mota produced 3.9 t/ha.







Location: Patuakhali sadar

Farmers Preference: BRRI dhan106>BRRI dhan98>BRRI dhan48>BRRI Hybri dhan7> BRRI dhan82

Exp. 5.2. Inclusion of Mungbean/Pumpkin in Fallow--Fallow-T.Aman cropping pattern.

Under PARTNER Project, one RFS site (Charamoddi) was selected for cropping pattern imptovement in Bakerganj. Baseline survey was conducted firstly followed by field trial and demonstration. Inclusion of Mungbean/Pumpkin in Fallow-Fallow-T.Aman cropping pattern increased the total productivity. 8.47 REY was obtained from Mungbean-Fallow-T.Aman and 8.17 REY was obtained from Pumpkin-Fallow-T.Aman.

(Mungbean yield: 1.6 t/ha, Market price: 130 Tk

Pumpkin yield: 325/bigha, Market Price 40 Tk/kg)

Location: Charamoddi, Bakerganj, Barishal

Location: Charamoddi, Bakerganj, Barishal

Inclusion of Aus in Mungbean-Fallow-T.Aman cropping pattern.

Under PARTNER Project, one RFS site (Dudhol Mou) was selected for cropping pattern imptovement in Bakerganj. Baseline survey was conducted firstly followed by field trial and demonstration. Inclusion of Aus in Mungbean-Fallow-T.Aman cropping pattern increased the total productivity. 13.08 REY was obtained from Mungbean-Aus-T.Aman cropping pattern.
(Mungbean yield: 1.65 t/ha, Market price: 130 Tk
Aus yield- BRRI dhan48: 4.98 t/ha, BRRI dhan98: 5.21 t/ha|)

Location: Dhudol mou, Bakerganj, Barishal

VI. TECHNOLOGY TRANSFER

Expt. 6.1: Advanced Line Adaptive Research Trial (ALART) in T. Aman 2023

A Sayem, MN Morshed, QSA Jahan

Three ALART programs of T. Aman 2023 was conducted at three locations of Barishal region i.e. Barishal sadar, Barishal; Bakerganj, Barishal and Patuakhali Sadar, Patuakhali.

Objectives: To evaluate the yield potential and adaptability of advanced breeding lines at farmers' field in different agro-ecological conditions and to get feedback information about the advantages and disadvantages of the advanced lines from farmers and DAE personnel.

Introduction: The Advanced Line Adaptive Research Trial (ALART) was conducted to test the yield potential and adaptability of advanced lines at farmers' field under different agro-ecological conditions of the country and to generate the feedback about the advantages and disadvantages of the lines from extension workers and farmers. This is an important step towards variety development.

A. ALART, BRRI dhan49 type rice (SHR-1), T. Aman 2023

A Sayem, MN Morshed, QSA Jahan

Materials and method: Two advanced line BRH13-2-14-2-1B and BR13-7-9-3-2B along with one check variety BRRI dhan49 were tested in Patuakhali Sadar upazila of Patuakhali district during T. Aman 2023. It was a three replicated trial. The unit plot size for each entry was 20 m^2 (5m × 4m). Seeding time was 13 July, 2023 and Seedling ages were 30 days. Seedlings were transplanted at 20 cm × 20 cm spacing. Fertilizers were applied at 90: 15: 50: 12: 3.6 kg NPKSZn /ha. All fertilizers except urea were applied as basal and urea was applied in 3 equal splits at 10 DAT, 25 DAT and 40 DAT. Other standard management practices were followed as and when necessary. Appropriate measures were taken to control insect pests. Date of seeding, transplanting, flowering and maturity, plant height, phenotypic acceptance at vegetative and ripening stage, yield and yield components was recorded. Feedback from farmers and DAE personnel were also recorded. For yield estimation, 10 m^2 sample area from each plot was harvested at maturity and grain yields were adjusted to 14% moisture content.

Results: Among the advanced lines and check varieties, the advanced line BR13-7-9-3-2B showed the highest mean grain yield (3.87 t/ha) followed by the check variety BRRI dhan49 (3.44 t/ha). On an average, all the entries matured within 136-144 days. The advanced line BRH13-2-14-2-1B had the longest growth duration (144 days). The mean plant height ranges from 95-107 cm where the advanced line BRH13-2-14-2-1B gave the highest plant height of 107 cm and plant height of BRRI dhan49 was the lowest (95 cm) (Table 72). All the data represented below are mean data from replicated entries.

Table 72: Data of ALART, BRRI dhan49 type rice (SHR-1), T. Aman 2023

Genotypes	GY (tha^{-1})	GD (Days)	PH (cm)
V1= BRH13-2-14-2-1B	3.36	144	107.2
V2= BR13-7-9-3-2B	3.87	136	105.3
V3= BRRI dhan49 (Ck)	3.44	140	95.1
CV (%)	**9.33**	**0.48**	**4.39**
LSD (0.05)	**0.75**	**1.51**	**10.21**

Recommendations: Based on higher yield and growth duration and farmers' opinion, the advanced line BR13-7-9-3-2B was recommended for further research program.

B. ALART, Swarna type rice (SHR-2), T. Aman 2023

A Sayem, MN Morshed, QSA Jahan

Materials and method: Two advanced lines BRH9392-6-2-1-3-4 and BR9396-6-2-2B along with one standard check BRRI dhan94 were tested in Bakerganj upazila of Barishal district during T. Aman 2022. It was a three replicated trial. The unit plot size for each entry was 20 m^2 (5m × 4m). Seeding time was 10 July 2023 and transplanting date was 10 August 2023. Seedlings were transplanted at 20 cm × 20 cm spacing. Fertilizers were applied at 90: 15: 50: 12: 3.6 kg NPKSZn /ha. All fertilizers except urea were applied as basal and urea was applied in 3 equal splits at 10 DAT, 25 DAT and 40 DAT. Other standard management practices were followed as and when necessary. Appropriate measures were taken to control insect pests. Date of seeding, transplanting, flowering and maturity, plant height, phenotypic acceptance at vegetative and ripening stage, yield and yield components was recorded. Feedback from farmers and DAE personnel were also recorded. For yield estimation, 10 m^2 sample area from each plot was harvested at maturity and grain yields were adjusted to 14% moisture content.

Results: Among the advanced lines and check varieties, the advanced line BR9396-6-2-2B showed the highest mean grain yield (4.10 t/ha) followed by the check variety BRRI dhan94 (3.55 t/ha). On an average, all the entries matured within 133-141 days. The check variety BRRI dhan94 showed the longest growth duration (141 days) while the advanced line BRH9392-6-2-1-3-4 showed shortest (133 days). The mean plant height ranged from 109-115 cm where the advanced line BRH9392-6-2-1-3-4 gave the highest plant height of 115 cm and plant height of BRRI dhan49 was the lowest (109 cm) (Table 73). All the data represented below are mean data from replicated entries.

Table 73: Data of ALART, Swarna type rice (SHR-2), T. Aman 2023

Genotypes	GY (tha^{-1})	GD (Days)	PH (cm)
V1= BRH9392-6-2-1-3-4	3.28	133	115.3
V2= BR9396-6-2-2B	4.10	137	109.3
V3= BRRI dhan94 (Ck)	3.55	141	109.1
CV (%)	**5.10**	**0.59**	**2.18**
LSD (0.05)	**0.42**	**1.85**	**5.51**

Recommendations: Based on higher yield and growth duration and farmers' opinion, the advanced line BR9396-6-2-2B was recommended for further research program.

C. ALART, Anti-oxidant enriched rice (AER), T. Aman 2023

A Sayem, MN Morshed, QSA Jahan

Materials and method: Two advanced lines BR12836-4R-63, BR12836-4R-312 and BR9396-6-2-2B along with two check varieties BRRI dhan34 and BRRI dhan70 were tested in Shikarpur, Ujirpur, Barishal during T. Aman 2022. It was a three replicated trial. The unit plot size for each entry was 20 m^2 (5m × 4m). Seeding time was 16 July 2023 and transplanting date was 23 August 2023. Seedlings were transplanted at 20 cm × 20 cm spacing. Fertilizers were applied at 90: 15: 50: 12: 3.6 kg NPKSZn /ha. All fertilizers except urea were applied as basal and urea was applied in 3 equal splits at 10 DAT, 25 DAT and 40 DAT. Other standard management practices were followed as and when necessary. Appropriate measures were taken to control insect pests. Date of seeding, transplanting, flowering and maturity, plant height, phenotypic acceptance at vegetative and ripening stage, yield and yield components was recorded. Feedback from farmers

and DAE personnel were also recorded. For yield estimation, 10 m^2 sample area from each plot was harvested at maturity and grain yields were adjusted to 14% moisture content.

Results: Among the advanced lines and check varieties, the check variety BRRI dhan70 showed the highest grain yield (2.99 t/ha). On an average, all the entries matured within 132-135 days. The mean plant height ranged from 93-133 cm where the check variety BRRI dhan34 gave the highest plant height (133 cm) and the advanced line BR12836-4R-63 gave the shortest plant height (93.9 cm) (Table 74). All the data represented below are mean data from replicated entries.

Table 74: ALART, Anti-oxidant enriched rice (AER), T. Aman 2023

Genotypes	GY (tha^{-1})	GD (Days)	PH (cm)
V1= BR12836-4R-63	1.63	135	93.9
V2= BR12836-4R-312	1.92	130	96.3
V3= BRRI dhan34 (Ck)	2.23	132	133.0
V4= BRRI dhan70 (Ck)	2.99	134	121.7
CV (%)	**13.37**	**0.48**	**4.48**
LSD (0.05)	**0.58**	**1.28**	**9.96**

Recommendations: Based on higher yield and growth duration and farmers' opinion, none of the advanced lines was recommended. But, as the advanced lines were different in terms of color, texture and other aspects from the check varieties the research can be carried on.

Expt. 6.2: Advanced Line Adaptive Research Trial (ALART) in Boro 2023-24

A Sayem, MN Morshed and MAI Khan

Three ALART programs of Boro 2023-24 were conducted at four locations of Barishal region.

Objectives: To evaluate the yield potential and adaptability of advanced breeding lines at farmers' field in different agro-ecological conditions and to get feedback information about the advantages and disadvantages of the advanced lines from farmers and DAE personnel.

A. ALART, Bacterial blight resistant rice (BB), Boro 2023-24

A Sayem, MN Morshed and MAI Khan

Materials and method: Three advanced lines viz. BR(path)13800-BC3-8-1, BR(path)13800-BC3-8-9 and BR(path)13800-BC3-224-28 along with two check varieties BRRI dhan89 and BRRI dhan92 were evaluated in Karamja, Barishal Sadar, Barishal during Boro 2023-24. It was a three replicated trial. The unit plot size for each entry was 20 m^2 (4m × 5m). Seeding date was 17 December, 2023 and Seedling age was 38 days while transplanting. Seedlings were transplanted at 25 cm × 15 cm spacing. Fertilizers were applied at 124: 22: 75: 20: 4 kg NPKSZn /ha. All fertilizers except urea were applied as basal and urea was applied in 3 equal splits at 15 DAT, 30 DAT and 45 DAT. Other standard management practices were followed as and when necessary. Appropriate measures were taken to control insect pests. Date of seeding, transplanting, flowering and maturity, plant height, phenotypic acceptance at vegetative and ripening stage, yield and yield components was recorded. Feedback from farmers and DAE personnel were also recorded. For yield estimation, 10 m^2 sample area from each plot was harvested at maturity and grain yields were adjusted to 14% moisture content.

Results: Among the entries, advanced line BR(path)13800-BC3-8-1 (5.3 t/ha) showed the highest grain yield followed by the advanced line BR(path)13800-BC3-224-28 (5.1 t/ha). The lowest grain yield was observed in the advanced line BR(path)13800-BC3-8-9. Growth duration

of the entries ranged from 139 days to 142 days. The highest growth duration was observed in the check variety BRRI dhan92 (142 days) and the lowest growth duration was observed in the advanced line BR(path)13800-BC3-224-28 (139 days). Plant height ranged from 108 cm to 123 cm, the tallest being BRRI dhan92 (123.5 cm) and the shortest being advanced line BR(path)13800-BC3-8-1 (108 cm) (Table75).

Table 75: **ALART, Bacterial blight resistant rice (BB), Boro 2023-24**

Genotypes	GY (tha^{-1})	GD (Days)	PH (cm)
V1= BR(path)13800-BC3-8-1	5.3	140	108.1
V2= BR(path)13800-BC3-8-9	4.1	141	111.8
V3= BR(path)13800-BC3-224-28	5.1	139	111.3
V4= BRRI dhan89(Ck)	4.6	140	115.7
V5= BRRI dhan92(Ck)	4.6	142	123.5
CV (%)	**11.03**	**0.33**	**2.43**
LSD (0.05)	**0.98**	**0.87**	**5.23**

Recommendations: Based on higher yield and growth duration and farmers' opinion, the advanced line BR(path)13800-BC3-8-1 and BR(path)13800-BC3-224-28 were recommended for further research program.

B. ALART, Blast and bacterial blight resistant Rice (BB+Blast), Boro 2023-24

A Sayem, MN Morshed and MAI Khan

Materials and method: Three advanced lines BR(path)13800-BC3-134-8, BR(path)13800-BC3-134-25, BR(path)13800-BC3-224-44 with check varieties BRRI dhan89 and BRRI dhan92 were tested in Mongolhata, Barishal sadar, Barishal during Boro 2023-24. It was a three replicated trial. The unit plot size for each entry was 20 m^2 (4m × 5m). Seeding date was 09 December, 2023 and Seedling age was 32 days while transplanting. Seedlings were transplanted at 25 cm × 15 cm spacing. Fertilizers were applied at 124: 22: 75: 20: 4 kg NPKSZn /ha. All fertilizers except urea were applied as basal and urea was applied in 3 equal splits at 15 DAT, 30 DAT and 45 DAT. Other standard management practices were followed as and when necessary. Appropriate measures were taken to control insect pests. Date of seeding, transplanting, flowering and maturity, plant height, phenotypic acceptance at vegetative and ripening stage, yield and yield components was recorded. Feedback from farmers and DAE personnel were also recorded. For yield estimation, 10 m^2 sample area from each plot was harvested at maturity and grain yields were adjusted to 14% moisture content.

Results: Among the advanced line and check varieties, Advanced line BR(path)13800-BC3-134-25 gave the highest yield (7.6 t/ha) followed by the 2nd highest average yield (7.6 t/ha) by advanced line BR(path)13800-BC3-134-8. On an average, all the entries matured within 144-150 days. BRRI dhan92 got the highest growth duration (GD) of 150 days. The highest plant height was observed in the check variety BRRI dhan89 (122 cm) and the lowest plant height was observed in BRRI dhan92 (110.6 cm). All the data represented below (Table 76) are mean data from replicated entries.

Table 76: **ALART, Blast and bacterial blight resistant Rice (BB+Blast), Boro 2023-24**

Genotypes	GY (tha^{-1})	GD (Days)	PH (cm)
V1= BR(path)13800-BC3-134-8	7.6	145	113.0
V2= BR(path)13800-BC3-134-25	7.7	145	115.4
V3= BR(path)13800-BC3-224-44	7.3	144	120.6
V4= BRRI dhan89(Ck)	7.1	149	122.0
V5= BRRI dhan92(Ck)	6.8	150	110.6
CV (%)	**6.97**	**0.35**	**3.16**

LSD (0.05)	**0.95**	**0.97**	**6.92**

Recommendations: Based on higher yield and growth duration and farmers' opinion, the advanced line BR(path)13800-BC3-134-8 and BR(path)13800-BC3-134-25 were recommended for further research program.

C. ALART, Salt tolerant rice (STR), Boro 2023-24

A Sayem, MN Morshed and MAI Khan

Materials and method: Four advanced lines BR11712-4R-44, BR11712-4R-93, BR11717-4R-12 and BR11727-4R-6 along with two check varieties BRRI dhan67 and BRRI dhan89 were tested in two locations i.e. Barishal Sadar, Barishal and Kolapara, Patuakhali districts during Boro 2023-24. It was a three replicated trial. The unit plot size for each entry was 20 m^2 (5m × 4m). Seeding time was 18 December, 2021 and seedling ages were 38 days (Barishal Sadar) and 41 days (Kolapara). Seedlings were transplanted at 20cm × 20cm spacing. Fertilizers were applied at 124-22-75-20-4 kg N, P, K, S and Zn/ha. Full amount of P, K, S and Zn were applied during land final land preparation. Urea was applied at 3 equal splits at 15 DAT, 30 DAT and 5days before panicle initiation. Additional 45kg MoP was applied with 3rd top dress of urea. Other standard management practices were followed as and when necessary. Appropriate measures were taken to control insect pests. Data related to date of seeding, transplanting, flowering and maturity, plant height, phenotypic acceptance at vegetative and ripening stage, yield and yield components was recorded. Feedback from farmers and DAE personnel were also recorded. For yield estimation, 12m2 sample area from each plot was harvested at maturity and grain yields were adjusted to 14% moisture content.

Results: Among the advanced lines and check varieties, the advanced lines BR11712-4R-44 (7 t/ha in Barishal and 5.6 ton in Kolapara) and BR11712-4R-93 (7.4 t/ha in Barishal and 5.5 t/ha in Kolapara) showed superior yield performance in both the locations. On an average, all the entries matured within 131-143 days. The check variety BRRI dhan89 got the highest growth duration (GD) at both locations (143 days at Barishal, 139 days in Kolapara) while the check variety BRRI dhan67 got the lowest growth duration in both locations (133 days at Barishal, 131 days at Kolapara). The mean plant height ranged from 97 cm to 134 cm the tallest being the advanced line BR11712-4R-93 and the shortest being the advanced line BR11727-4R-6. All the data represented below (Table 77) are mean data from replicated entries.

Table 77. Data of ALART, Salt tolerant rice (STR), Boro 2023-24

Genotypes	**GY (t/ha)**		**GD (days)**		**PH (cm)**	
	Barishal	**Kolapara**	**Barishal**	**Kolapara**	**Barishal**	**Kolapara**
V1= BR11712-4R-44	7.0	5.6	140	133	112.8	116.1
V2= BR11712-4R-93	7.4	5.5	141	133	134.4	134.3
V3= BR11717-4R-12	6.3	4.6	140	135	120.6	119.3
V4= BR11727-4R-6	7.1	4.5	135	132	97.1	98.6
V5= BRRI dhan67 (Tol. Ck)	4.5	5.0	133	131	111.5	112.7
V6= BRRI dhan89 (Sensitive Ck)	6.3	5.0	143	139	108.9	107.9
CV (%)	**10.73**		**0.44**		**4.20**	
LSD (0.05)	**1.04**		**1.02**		**8.15**	

Recommendations: Based on higher yield and growth duration and farmers' opinion, the advanced lines BR11712-4R-44 and BR11712-4R-93 were recommended for further research program.

Activity 1
Demonstration, seed production and scaling up of BRRI rice varieties

T. Aman 2023
New HYV's of BRRI i.e. BRRI dhan44, BRRI dhan52, BRRI dhan72, BRRI dhan76, BRRI dhan77 and BRRI dhan87 were demonstrated in 350 acres of land as block demonstration which covered the 25 upazilas of six districts of Barishal Division under GOB fund. Among them 160acres of land were supported by seed and fertilizer and the rest 190 acre were demonstrated with free seed support. From the demonstrated varieties, BRRI-Barishal tried to motivate farmers to replace farmers' local varieties to BRRI released latest Aman varieties. The highest yield was obtained by BRRI dhan87 (6.35 t/ha) followed by BRRI dhan52 (5.32 t/ha) and BRRI dhan76 (4.52 t/ha). As Barishal region is under tidal submergence ecosystem and is difficult to grow BRRI dhan87 and its growth duration is about 125-130 days only. However, in medium lowland (Phase-1) especially Uzirpur; Gournadi, and Bhola sadar it gave comparatively higher yield than others. However, it was chosen by those farmers who wanted to do oil crop after Aman season. The other farmers preferred BRRI dhan52 and BRRI dhan76 wanted to cultivate these varieties for the next year along with neighboring farmers.

Boro 2023-24
A total of 1506 number of demonstrations were conducted where 1050 were both seed and fertilizer supported and rest were supported only seed by BRRI Barishal. The activity covered 806 acres land of 20 Upazilas of Barishal Division. BRRI released HYV (BRRI dhan29, BRRI dhan47, BRRI dhan50, BRRI dhan67, BRRI dhan74, BRRI dhan84, BRRI dhan88, BRRI dhan89, BRRI dhan92, BRRI dhan96, and BRRI dhan97) and Hybrid varieties (BRRI hybrid dhan3, BRRI hybrid dhan5) were allocated for distribution. Farmers under the demonstration were advised for maximizing yield. At maturity, the crop cut data were collected for each variety of every demonstration plot.
The hybrid varieties BRRI hybrid dhan5 gave highest average yield (8.31 t/ha) among the hybrid varieties. In HYV, BRRI dhan89 and BRRI dhan92 performed about same yield which is 8.15 t/ha and 7.82 t/ha respectively. However, BRRI dhan74 attracted farmers a lot for its coarseness, tastiness and zinc enriched virtue. Overall, its life duration is lower than BRRI dhan89 and BRRI dhan92. Among saline tolerant varieties BRRI dhan97 did well and farmers liked for its boldness. Farmers also preferred BRRI dhan67 due to its cold tolerance and high fertility percentage.

Breeder seed and TLS production
For breeder seed production, single seedling was transplanted at 20 x 20 cm spacing. BRRI recommended practices for crop cultivation was followed. In Aus, total 4,308 kg TLS seeds were produced in Char badna farm, Barishal (Table 78). In T. Aman 2023, a total of 26560 kg and in Boro 2023-24, a total of 32520 kg breeder seed were produced (Table 79,80). In T. Aman 2023, a total of 5980 kg and in Boro 2023-24, a total of 25418 kg TLS BRRI released varieties was produced in BRRI, Barishal (Table 79,80).

Table 78. Breeder Seed and TLS Production in Aus 2023

Varieties	TLS (kg)
BRRI dhan48	3040
BRRI dhan82	988
BRRI dhan98	280
Total	4308

Table 79. Breeder Seed and TLS Production in T. Aman 2023

Varieties	Breeder Seed (kg)	TLS (kg)
BR22	-	500
BR23	7700	100
BRRI dhan34	3800	80
BRRI dhan41	-	240
BRRI dhan44	-	650
BRRI dhan48	4360	-
BRRI dhan49	-	400
BRRI dhan52	5600	1500
BRRI dhan72	-	300
BRRI dhan76	1000	890
BRRI dhan77	-	310
BRRI dhan85	1780	-
BRRI dhan87	2320	60
BRRI dhan90	-	40
BRRI dhan93	-	370
BRRI dhan103		540
Total	**26560**	**5980**

Table 80. Breeder Seed and TLS Production in Boro 2023-2024

Varieties	Breeder Seed (Kg)	TLS (Kg)
BR26	1000	1463
BRRI dhan28	4680	741
BRRI dhan29	5800	190
BRRI dhan67	5120	1349
BRRI dhan74	-	8702
BRRI dhan89	-	3021
BRRI dhan92	3000	760
BRRI dhan97	-	2147
BRRI dhan98	-	266
BRRI dhan99	-	798
BRRI dhan101	-	608
BRRI dhan102	-	361
BRRI dhan103	2400	1320
BRRI dhan104	-	1539
BRRI dhan107	-	1013
Total	32520	**25418**

Activity 2

Farmer's training under different projects/GoB

Farmers' training programs were conducted at different locations of Barishal region with the collaboration of DAE. The farmers were selected with the assistance of local SAAO from different villages of the mentioned locations. The training module was developed considering modern rice production techniques, appropriate rice cultivar for tidal non-saline ecosystem, and pest, disease, irrigation and fertilizer management for better rice production. The training courses were delivered using colorful slides and videos through multimedia projector for easy understanding to the trainees. BRRI Barishal Regional Station conducted farmers' training in different locations of Barishal region during the reporting period. Forty farmers' trainings were conducted under GoB. A total of 832 male, 448 female farmers, 92 SAAO/SA were trained under GoB training program (Table 81). These programs certainly helped the farmers to create awareness for adopting the BRRI rice production technologies. Trainees were learned on eco-

friendly pest management and the dissemination rate of BRRI varieties, cutting edge technologies of Farming systems research was accelerated in those areas. Thus, trainings on modern rice production confidently increase the farmers' income as well as improve the livelihood through practicing the farming systems approach.

Table 81. Daylong farmers' trainings at Barishal Region on modern rice production technology during 2023-2024

Sl. No.	Name of the training program	Duration	Total training	Participant				Total
				Male	Female	SAAO/SA	NGO Personnel	
01	Modern Rice Production Training	1 day	46	840	448	92	00	1380

Activity 3

Farmers' field day under different projects/GOB

Ten field days were conducted with the collaboration of DAE at different locations of Barishal region. Farmers, researchers, extension providers, NGO personnel, administrative peoples, public leaders were sincerely participated in this program. Firstly, the participants gathered and visited the rice field together. A sample area of 10 m^2 was harvested followed by threshing, weighing by the presence. Later, a fruitful discussion was held among the participants. It was perceived that a noticeable number of female farmers were also present and participated on these field days. About 2400(1650 male and 750 female) farmers, extension personnel, administrative peoples, public leaders were targeted to participate on these programs. Farmers liked BRRI dhan76 for its tolerant to tidal surge and BRRI dhan87 or its higher yield. BRRI dhan98 and BRRI dhan74 are being popular in Barishal region during Aus and Boro season respectively.

Recommendations were as follows:

1. Irrigation facility area has to be increased.
2. Need integrated and co-ordinated works among all departments related to agriculture.
3. Need to improve the present cropping pattern (Aman-Fallow-Fallow or Boro-Fallow-Fallow) and another new crop has to be introduced in these cropping patterns.
4. Sweet water rivers in Barishal region should be used properly for irrigation purpose.
5. Maintenance and operation of sluice gate have to be managed properly.
6. Projects may be taken to increase irrigation command area.
7. Balance is needed between inbreed and hybrid varieties.
8. High yielding rice varieties of BRRI have to be introduced for increasing cropping Intensity.
9. Demonstration and training must be increased on saline tolerant variety.
10. More agricultural machineries should be supplied for Barishal region for improve productivity of rice.

List of Publications

1. Nihad SAI, Hasan MAI, Anik TR, Rashid MM, **Khan MAI**, Islam MR, Latif MA. 2024. Pyramiding of blast and bacterial blight resistance genes in premium quality rice variety, BRRI dhan63 through marker-assisted breeding approach. Euphytica 220, 13. https://doi.org/10.1007/s10681-023-03255-5
2. Niaz MF Rahman, Waqas AM, MA Baten, MS Kabir, MC Rahman, R Ahmed, ABMZ Hossain, MM Hossain, T Halder, MKA Bhuiyan, **MAI Khan**, RH Khan, N Ahasan and HP Piepho. 2023. Sustaining rice productivity through weather-resilient agricultural practices. Journal of The Science of Food and Agriculture. DOI 10.1002/jsfa.13119

3. Quazi Mostaque Mahmud, Md. Rejwan Bhuiyan, Md. Motaher Hossain, Nur Ausraf, Md. Shahid Islam, Md. Hasibur Rahaman Hera, Md. Mamunur Rashid, Md. Abdul Mannan Akanda, M. Mofazzal Hossain, Md. Tajul Islam Chowdhury, Md. Abdul Latif, Mitsuhiro Obara, Yoshimichi Fukuta and **Mohammad Ashik Iqbal Khan**. 2024. Pathogenicity of rice blast isolates (*Pyricularia oryzae*) in irrigated lowland of Bangladesh. Journal of Phytopathology. https://doi.org/10.1111/jph.13271
4. Mohammad Abdul Latif, Lutfur Rahman, Nazmul Islam, Md. Omar Kayess, Md. Mamunur Rashid, Md. Al-Imran Hasan and **Mohammad Ashik Iqbal Khan**. 2024. Pathotypic diversity of *Xanthomonas oryzae* pv. *oryzae*, and stringent evaluation of resistance lines of Rice in Bangladesh. Eur J Plant Pathol. https://doi.org/10.1007/s10658-024-02900-6
5. A. K. M. Sahfiqul Islam, Rejwan Bhuiyan, Sheikh Arafat Islam Nihad, Rumana Akter, **Mohammad Ashik Iqbal Khan**, Shamima Akter, Md. Rashidul Islam, Md. Atiqur Rahman Khokon, Mohammad Abdul Latif. 2024. Green synthesis and characterization of silver nanoparticles and its efficacy against *Rhizoctonia solani*, a fungus causing sheath blight disease in rice. PLOS ONE. https://doi.org/10.1371/journal.pone.0304817
6. QM Mahmud, **MAI Khan**, AM Akanda, MM Hossain, MA Latif, R Akter, MM Hossain. 2023. Antifungal Potential of Commercial Silver Nano-particles against Rice Blast Pathogen (*Magnaporthe oryzae*). Ann. Bangladesh Agric. 27 (1) : 77-90.
7. Gayatri Goswami, Priya Lal Biswas, Prosenjit Sarker, Naima Sultana, Debika Sarkar and Ujjal Kumar Nath. 2024. Marker-Assisted Introgression of Bacterial Blight and Blast Resistance Genes into Mega Rice Cultivar BRRI dhan28. International Journal of Agriculture & Environmental Science 11(4):47-55. DOI: 10.14445/23942568/IJAES-V11I4P107
8. Gayatri Goswami, **Priya Lal Biswas**, Prosenjit Sarker, Naima Sultana, Debika Sarkar and Ujjal Kumar Nath. 2024. Marker-Assisted Introgression of Bacterial Blight and Blast Resistance Genes into Mega Rice Cultivar BRRI dhan28. International Journal of Agriculture & Environmental Science 11(4):47-55. DOI: 10.14445/23942568/IJAES-V11I4P107
9. **Priya Lal Biswas**, S. M. Hisam Al Rabbi, Anowara Akter, Hirendra Nath Barman, Laila Ferdousi Lipi, Md. Ruhul Quddus, **Tomalika Saha**, Gayatri Goswami and Ujjal Kumar Nath. 2024. Hybrid rice research and cultivation in Bangladesh: potentiality and prospects. International Journal of Scientific Research 13(6). DOI : 10.36106/ijsr