

Development of rice varieties BRRI dhan93, BRRI dhan94 and BRRI dhan95 for rainfed lowland ecosystem of Bangladesh

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Received 27th October, 2020; Accepted 19th November, 2020

ABSTRACT: Newly released rice varieties BRRI dhan93, BRRI dhan94 and BRRI dhan95, are suitable for rainfed lowland ecosystem of Bangladesh as an improvement over existing rice varieties. These varieties have satisfactorily been passed in the proposed varietal trial conducted at the farmers' field. As a result, National Seed Board (NSB) approved these for commercial cultivation in the wet season in September 2019. BRRI dhan93, BRRI dhan94 and BRRI dhan95 have modern plant type with 117, 118 and 120 cm plant height and matures in 134 days, 134 days and 125 days with production of 5.8, 5.9 and 5.7 t/ha yield respectively. BRRI dhan93 has deep green leaf, erect flag leaf, late leaf senescence, 1000 grain weight is 18.95 g having reddish colored medium bold grain. BRRI dhan94 has deep green leaf, semi-erect flag leaf, 1000 grain weight of 18.60 g having reddish colored medium bold grain. BRRI dhan95 has deep green leaf, erect flag leaf, 1000 grain weight is 21.50 g and medium bold type deep red coloured attractive grain. BRRI dhan93, BRRI dhan94 and BRRI dhan95 are highly promising rice varieties for cultivation in the rainfed lowland area which help farmers to obtain high economic output and contribute to sustaining food security.

Keywords: Colored grain, replacement, variety, wet season and yield.

INTRODUCTION

Rice belongs to the diploid species having $2n=24$ chromosome and is classified as monocotyledon under the family Poaceae (Gramineae) under the tribe known as *Oryza* that fall in order Cyperales (Rangare et al., 2012). *Oryza sativa* is the dominantly grown rice species divided into sub species/strains indica and japonica. Rice is grown under diverse condition and over wide geographical range. It is grown at the latitude ranging from 50° North to 36° South to 25,000 m high altitude in northern upland valleys and terraces in the arid hot zones to the tropical humid. In 2010, approximately 154 million ha rice area were harvested worldwide, of which 137 million ha (88% of the global rice harvested) were in Asia, of which 48 million ha (31% of the global rice harvested) were harvested in

Southeast Asia alone (FAOSTAT, 2012).

In context of Bangladesh, agriculture is the vital sector for attaining the development goals of alleviating poverty and increasing food security. Reducing poverty and improving food security through stimulating agricultural growth primarily depends on the adoption of modern agricultural technologies, including modern rice varieties (MVs) (Kader et al., 2020a). Rice is the staple food for more than 3 billion people in Asia, where more than 90% of the world's rice is produced and consumed (Li and Xu, 2007). It is grown worldwide in 154 million hectares and more than 45% of the area is in rainfed ecosystems (IRRI, 2002).

Asian and African farmers grow different types of rice to

suit local condition and needs (Singh et al., 2000). Rice plays a vital role in Bangladesh's economy and agriculture, accounting for nearly 18% of the gross domestic product (BBS, 2017). About 76% of the total cropped land is covered by rice and more than 66% of the total agriculture labour force is employed in rice production, processing, marketing and distribution. It provides about 62% of the calories and 46% of the protein in the average daily diet for the people of the country (HIES, 2010). Bangladesh is the fourth largest producer and consumer of rice in the world with an annual production of 34.71 million metric tons (BBS, 2017).

Rice is considered as a major crop in Bangladesh as it constitutes 94.38% of the total food grain (rice and wheat) production of 26.7 million metric tons (Anonymous, 2004). It is the staple food and ranks first position by production among cereals in Bangladesh. Although Bangladesh is now on the verge of attaining self-sufficiency in cereal production, there is still a large gap between the production and demand. Among other ecosystem, rainfed lowland (Transplanted Aman) is the most suitable for growing rice in the climatic condition of Bangladesh. Area under Transplanted Aman is the largest which is about 53% of total rice land and contributes 45% of the total rice production (BBS 2001). Rice is grown in about 11.35 million hectares of land in three distinct rice growing seasons: Boro (Dec-April), Aus (April-July) and Aman (Aug-Nov) (Hussain et al., 2012). The majority of rice area is covered by transplanted Aman rice comprising about 5.53 million hectares of the total rice area (BBS, 2015).

The main objective of this study is to evaluate agronomic parameters of rice varieties BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 under rainfed lowland rice ecosystem for Transplanted Aman season. The multi-location yield trials in multiple years demonstrated that BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 are more potential rice variety than existing one. To release BR-SF(Rang)-PL1-B, BR-RS(Raj)-PL4-B and BR8210-10-3-1-2 as variety BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 respectively, the yield and other parameters were observed which have been discussed very intensively in this study.

MATERIALS AND METHODS

BRR1 dhan93 and BRR1 dhan94 are originated from pure line selection of Swarna-5 and Ranjit Swarna, the advanced breeding lines are BR-SF(Rang)-PL1-B and BR-RS(Raj)-PL4-B respectively. BRR1 dhan95 comes from three way cross of Swarna and Barisail/PSBRC2 through pedigree method, the advanced breeding line is BR8210-10-3-1-2. All advanced breeding lines of BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 were evaluated through different trials in Bangladesh until 2017. The promising lines were subjected to Advanced Yield Trial (AYT) to evaluate specific and general adaptability with standard check BRR1 dhan49 in on-station condition of BRR1 in randomized complete block (RCB) design with three

replications in Transplanted Aman 2015. After proper yield evaluation these materials were subjected to Advanced Lines Adaptive Research Trial (ALART) to evaluate specific and general adaptability with standard check BRR1 dhan49 in the farmers' field condition in Transplanted Aman 2016, conducted by Adaptive Research Division (ARD) of BRR1. These genotypes were tested for different physico-chemical properties, cooking qualities and best planting time, disease-insect reactions under natural condition. Plant height, tillering ability were recorded from the 10 random plants excluding border rows. Growth duration was counted from seedling to 80% grain maturity. Grain yield data was taken from 10 sq-m sample plot in each replication. In Transplanted Aman 2017, BR-SF(Rang)-PL1-B (BRR1 dhan93), BR-RS(Raj)-PL4-B (BRR1 dhan94) and BR8210-10-3-1-2 (BRR1 dhan95) were evaluated with standard check variety BRR1 dhan49 by the National Seed Board of Bangladesh (NSB) in 10 locations of farmers' field in Bangladesh under field trial named Proposed Variety Trial (PVT). Finally, after proper evaluation, the NSB team recommended BR-SF(Rang)-PL1-B, BR-RS(Raj)-PL4-B and BR8210-10-3-1-2 as superior genotypes in respect to rainfed lowland ecosystem for release as BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 respectively in 2019. The data were analyzed with software namely PTools and Microsoft excel 2013 (Yan and Tinker, 2006; PTools, 2013).

RESULTS AND DISCUSSION

Advanced yield trial (AYT)

The agro-morphological characteristics of BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 is shown in Table 1 and Table 2. These varieties have intermediate plant height and growth duration with deep green, erect, long and wide flag leaf (Figures 1, 2 and 3) which facilitates maximum solar light uptake. The advanced yield trial of BRR1 dhan93, BRR1 dhan94 and BRR1 dhan95 with check variety BRR1 dhan49 was conducted in Bangladesh Rice Research Institute. BRR1 dhan93 showed the maximum yield (4.32 t/ha) and BRR1 dhan94 showed 4.30 t/ha yield whereas check variety BRR1 dhan49 gave 4.20 t/ha yield (Table 1). In a separate trial BRR1 dhan95 showed highest yield (5.52 t/ha) than the check variety BRR1 dhan49 (5.42 t/ha) with one week early than check variety in case of growth duration (Table 2) in Transplanted Aman 2015. The grain color of BRR1 dhan93 and BRR1 dhan94 is reddish colored and grain color of BRR1 dhan95 is deep red color (Figures 4, 5 and 6) which are most attractive and desirable (Kader et al., 2020a; Khatun et al., 2019).

Advanced lines adaptive research trial (ALART)

BR-SF(Rang)-PL1-B (BRR1 dhan93), BR-RS(Raj)-PL4-B (BRR1 dhan94) and check variety BRR1 dhan49 were

Table 1. Morphological and agronomical characters of the proposed varieties, T. Aman 2015.

Designation	Plant height (cm)	Growth duration (days)	Grain yield (t/ha)
BR-SF(Rang)-PL1-B (BRRRI dhan93)	117	137	4.32
BR-RS(Raj)-PL4-B (BRRRI dhan94)	118	137	4.30
BRRRI dhan49 (Ck.)	103	133	4.20
LSD (0.05)	2.0	2.20	0.21
Heritability %	0.85	0.82	0.76

Table 2. Morphological and agronomical characters of the proposed variety, T. Aman 2015.

Designation	Plant height (cm)	Growth duration (days)	Grain yield (t/ha)
BR8210-10-3-1-2 (BRRRI dhan95)	120	130	5.52
BRRRI dhan49 (Ck.)	103	137	5.42
LSD (0.05)	2.0	2.20	0.21
Heritability %	0.85	0.82	0.76

**Figure 1.** Plant view of BRRRI dhan93.

evaluated in eight locations (Gazipur, Nilphamari, Panchagar, Thakurgaon, Rangpur, Naogaon, Rajshahi and Chapainowabganj) in the farmers' field of Bangladesh in Transplanted Aman 2016. The results are showed in the Table 3. Average highest grain yield (4.95 t/ha) was found in BR-RS(Raj)-PL4-B (BRRRI dhan94) followed by BR-SF(Rang)-PL1-B (BRRRI dhan93) (4.80 t/ha) compared to check variety BRRRI dhan49 (4.7 t/ha). Also, BR8210-10-3-1-2 (BRRRI dhan95) and check variety BRRRI dhan49 were evaluated in the same eight locations in the farmers' field of Bangladesh in Transplanted Aman 2016. The results

are showed in the Table 4. Over these locations, BR8210-10-3-1-2 (BRRRI dhan95) gave 4.89 t/ha yield where check variety BRRRI dhan49 gave 4.80 t/ha yield. One week earlier growth duration was the advantage of this genotype over the check variety (Kader et al., 2020b).

Proposed variety trial (PVT)

Performance of the BR-SF(Rang)-PL1-B (BRRRI dhan93), BR-RS(Raj)-PL4-B (BRRRI dhan94) and BR8210-10-3-1-2



Figure 2. Plant view of BRR1 dhan94.



Figure 3. Plant view of BRR1 dhan95.

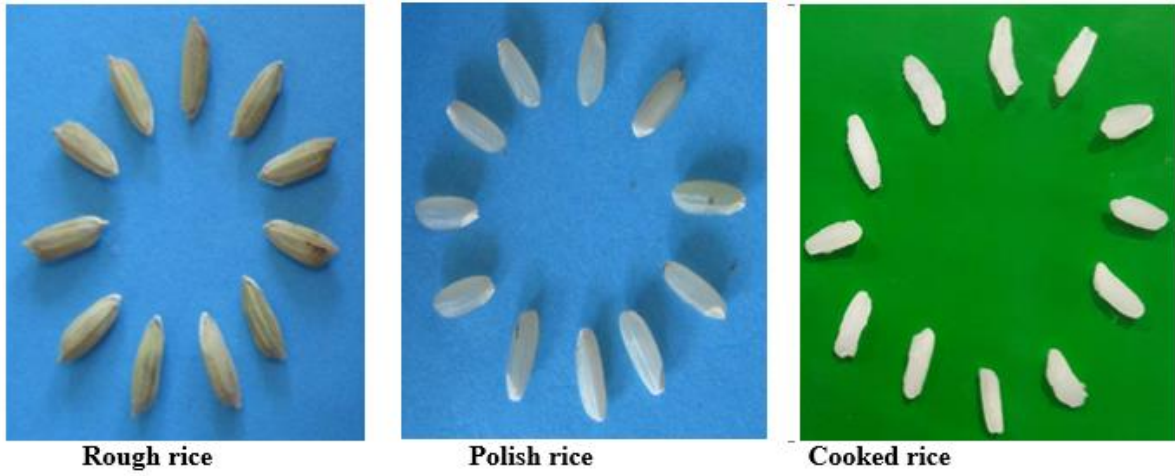


Figure 4. BRR1 dhan93.

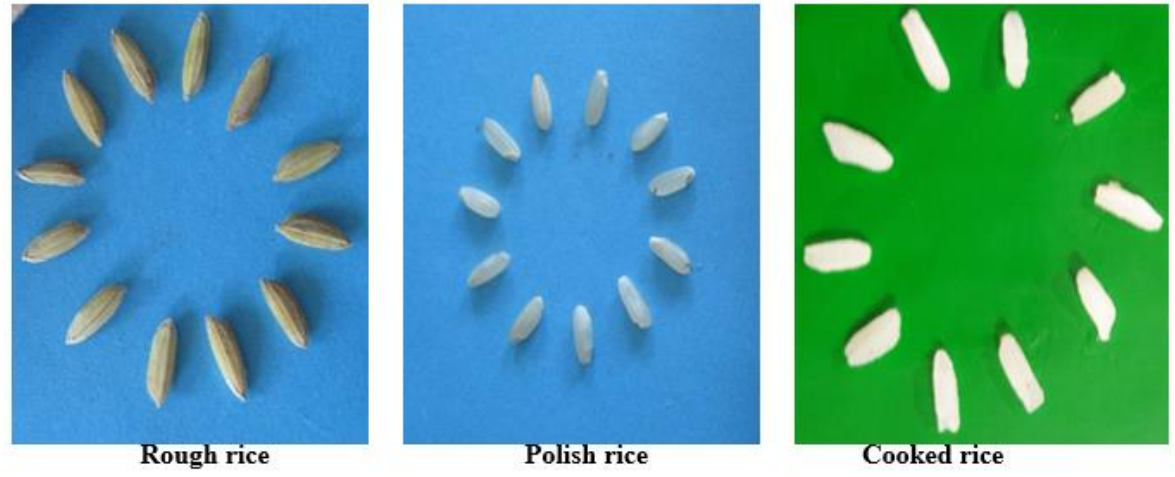


Figure 5. BRR1 dhan94.

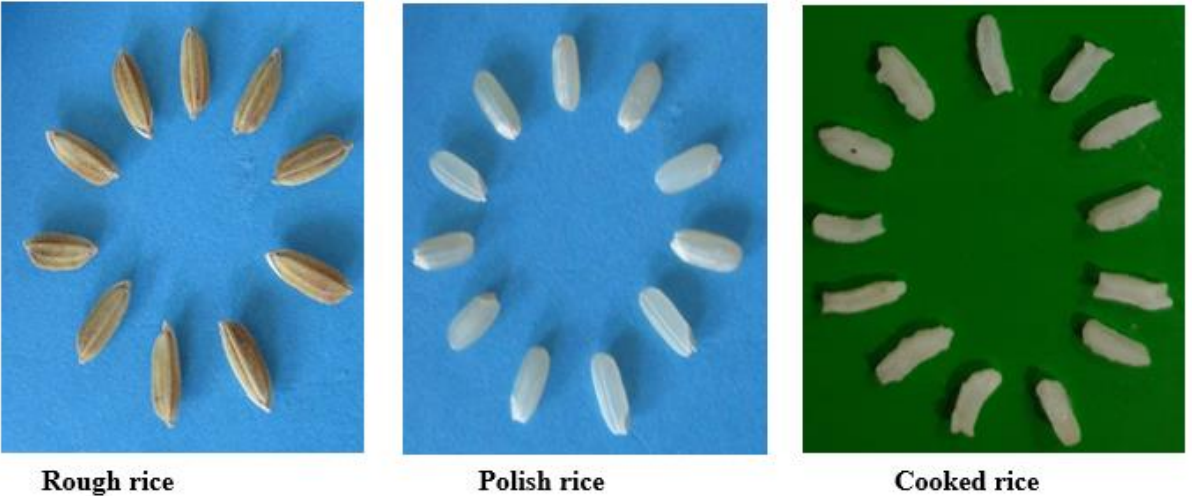


Figure 6. BRR1 dhan95.

Table 3. Performance of the proposed varieties at different Zonal Trial, T. Aman 2016.

Designation	Plant height (cm)	Growth duration (Days)	Yield (t/ha)								
			L1	L2	L3	L4	L5	L6	L7	L8	Mean
BR-SF(Rang)-PL1-B (BRRi dhan93)	117	137	4.56	5.97	4.74	5.04	4.03	4.71	4.40	4.99	4.80
BR-RS(Raj)-PL4-B (BRRi dhan94)	118	138	4.31	5.43	5.04	5.48	4.83	4.52	4.92	5.07	4.95
BRRi dhan49 (Ck.)	103	133	4.70	5.51	4.88	4.97	4.43	4.65	4.87	3.60	4.70
LSD (0.05)	1.67	2.11									0.15

L1= Gazipur, L2= Nilphamari, L3= Panchagar, L4= Thakurgaon, L5= Rangpur, L6= Naogaon, L7=Rajshahi, L8=Capainowabganj

Table 4. Performance of the proposed variety at different Zonal Trial, T. Aman 2016.

Designation	Plant Height (cm)	Growth Duration (Days)	Yield (t/ha)								
			L1	L2	L3	L4	L5	L6	L7	L8	Mean
BR8210-10-3-1-2 (BRRi dhan95)	119	125	4.42	5.10	4.72	3.53	3.83	5.80	4.50	4.25	4.89
BRRi dhan49 (Ck.)	101	132	5.00	4.81	5.36	3.79	4.25	5.60	4.95	4.63	4.80
LSD (0.05)	1.67	2.11									0.15

L1=Gazipur, L2= Thakurgaon, L3= Panchagar, L4= Chpainwabganj, L5= Rangpur, L6= Nilphamari, L7=Rajshahi, L8=Naogaon.

(BRRi dhan95) were evaluated by the National Seed Board (NSB) of Bangladesh in Transplanted Aman 2017 season under on-farm condition (Table 5). The highest yield was found in BR-RS(Raj)-PL4-B (5.89 t/ha) followed by BR-SF(Rang)-PL1-B (5.79 t/ha) and BR8210-10-3-1-2 (5.65 t/ha) over the check variety BRRi dhan49 (5.06 t/ha). The growth duration of BR-SF(Rang)-PL1-B and BR-RS(Raj)-PL4-B was similar to BRRi dhan49, but the growth duration of BR8210-10-3-1-2 was around one week earlier than BRRi dhan49 (Shalahuddin et al., 2019).

Among the newly released varieties, BRRi dhan94 has the highest potentiality to give maximum yield (7.40 t/ha) followed by BRRi dhan93 (7.25 t/ha) and BRRi dhan95 (6.55 t/ha) compared with check variety BRRi dhan49 (6.20 t/ha) (Figure 7).

Disease and insect reactions

BR-SF(Rang)-PL1-B (BRRi dhan93), BR-RS(Raj)-PL4-B (BRRi dhan94) and BR8210-10-3-1-2 (BRRi dhan95) showed tolerance to major diseases and insects under the natural field condition. These genotypes showed bacterial blight infestation score 1, 1 and 3 respectively meaning more or less tolerant to bacterial blight disease (Table 6). These were also found more or less tolerant to sheath blight disease (Table 6). These were tolerant to stem borer for the dead heart and white head symptoms count, BRRi dhan49 also showed similar symptoms (Table 6). On the other hand, under artificial inoculated condition, these genotypes and BRRi dhan49 (check variety) showed similar symptoms (Table 7).

Distinctiveness, uniformity and stability test

Distinguishing characters of the candidate variety BR-SF(Rang)-PL1-B (BRRi dhan93) compared to the check variety BRRi dhan49 are leaf color, penultimate leaf: pubescence of blade, culm diameter, culm: length, panicle: number of effective tillers in plant, spikelet: pubescence of lemma and palea, panicle: exertion, time of maturity, grain: wt of 1000 fully developed grains (at 12%), leaf senescence and other distinct special character (if any) (Table 8). Distinguishing characters of the candidate variety BR-RS(Raj)-PL4-B (BRRi dhan94) compared to the check variety BRRi dhan49 are leaf color, penultimate leaf: pubescence of blade, flag leaf: attitude of blade, culm diameter, number of effective tillers in plant, panicle: exertion, grain: wt of 1000 fully developed

Table 5. Performance of the proposed variety at on farm trial, Transplanted Aman 2017.

Locations	Proposed Variety						Check	
	BR-SF(Rang)-PL1-B		BR-RS(Raj)-PL4-B		BR8210-10-3-1-2		BRRi dhan49 (Ck)	
	Growth Duration (Days)	Grain yield (t/ha)	Growth duration (Days)	Grain yield (t/ha)	Growth duration (Days)	Grain yield (t/ha)	Growth duration (Days)	Grain yield (t/ha)
L1	129	5.05	128	5.26	124	5.72	127	3.98
L2	132	5.69	131	5.36	126	5.50	130	5.04
L3	137	6.23	139	6.29	126	5.88	136	5.85
L4	135	4.89	135	4.36	126	4.70	136	4.39
L5	136	5.46	136	5.73	124	4.75	130	3.77
L6	137	5.76	137	5.91	125	4.98	131	4.43
L7	132	6.30	132	6.60	126	6.20	129	6.20
L8	138	4.76	136	5.53	123	5.98	131	5.90
L9	137	7.25	137	7.40	125	6.27	130	5.28
L10	131	6.52	132	6.48	125	6.55	128	5.74
Mean	134	5.79	134	5.89	125	5.65	131	5.06
CV%	12.51	10.36	12.51	10.36	12.51	10.36	12.51	10.36
LSD (0.05)	1.65	0.18	1.65	0.18	1.65	0.18	1.65	0.18
Heritability%	0.82	0.79	0.82	0.79	0.82	0.79	0.82	0.79

L1=Rajshahi (Paba), L2=Rajshahi (Chapainowabgonj), L3=Satkhira (Jashore), L4=Satkhira, L5=Rangpur (Dinajpur), L6=Rangpur (Mithapukur), L7=Kushtia, L8=Cumilla, L9=Bogura, L10=Gazipur.

grains (at 12%) and other distinct special character (if any) (Table 8). Distinguishing characters of the candidate variety BR8210-10-3-1-29 (BRRi dhan95) compared to the check variety BRRi dhan49 are leaf color, penultimate leaf: pubescence of blade, flag leaf: attitude of blade, time of heading (50% of plants with heads), culm diameter, culm: length, panicle: number of effective tillers in plant, spikelet: pubescence of lemma and palea, panicle: exertion, time of maturity, grain: wt of 1000 fully developed grains (at 12%), leaf senescence and other distinct special character (if any) (Table 8). The pictorial view of BRRi dhan93, BRRi dhan94 and BRRi dhan95 are shown in Figures 1, 2 and 3 respectively.

Uniformity

At 50% heading date time only 0.5% off-type was observed for BR-SF(Rang)-PL1-B, BR-RS(Raj)-PL4-B and BR8210-10-3-1-29 lines. It indicated that the candidate varieties are uniform according to International Union for the Protection of New Varieties of Plants (UPOV) standard.

Stability

In the test plots of two consecutive seasons trials, no remarkable variation and segregation were noted which implied the stability of the candidate varieties.

Physico-chemical properties

BRRi dhan93 has medium bold grain having length-breadth ratio of 2.5 which is same as BRRi dhan49. The milling outturn of the variety was 72.0% with the head rice recovery 65.0% and amylose content was 26.1% which were better than BRRi dhan49 (Table 9). BRRi dhan94 has medium bold grain having length-breadth ratio of 2.5 which is same as BRRi dhan49. The milling outturn of the variety was 70.0% and amylose content was 25.7% which were better than BRRi dhan49 (Table 6). BRRi dhan95 has medium bold grain having length-breadth ratio of 2.5 which is same as BRRi dhan49. The milling outturn of the variety was 68.0% with head rice recovery 66.0% were also

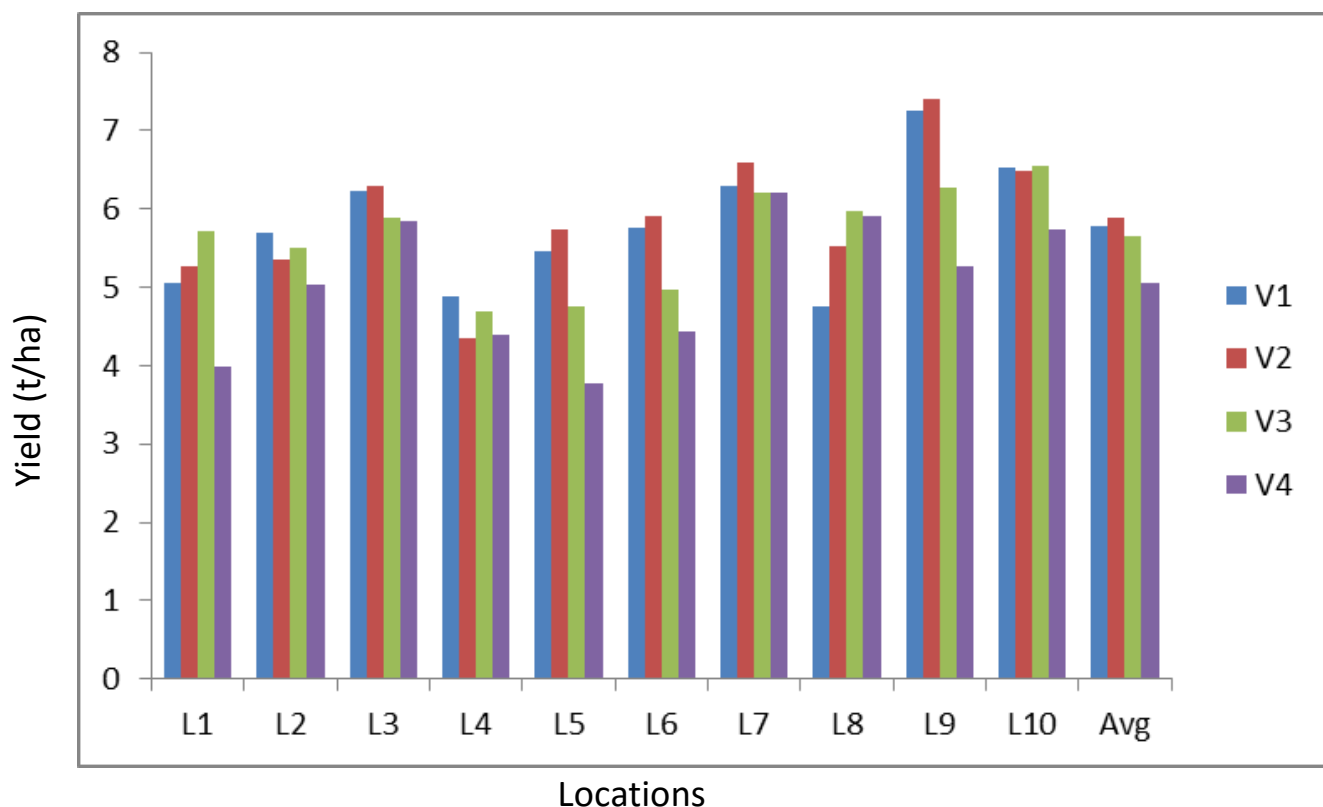


Figure 7. Yield comparison among BRRi dhan93, BRRi dhan94, BRRi dhan95 and BRRi dhan49. Locations: L1=Rajshahi (Paba), L2=Rajshahi (Chapainowabgonj), L3=Satkhira (Jessor), L4=Satkhira, L5=Rangpur (Dinajpur), L6=Rangpur (Mithapukur), L7=Kushtia, L8=Cumilla, L9=Bogura, L10=Gazipur, V1= BRRi dhan93, V2= BRRi dhan94, V3= BRRi dhan95, V4= BRRi dhan49, Avg= Average.

Table 6. Reaction of the proposed varieties against major diseases and insects under natural field condition.

Designation	BB	ShB	Blast	DH	WH
BR-SF(Rang)-PL1-B (BRRi dhan93)	1	3	0	1	1
BR-RS(Raj)-PL4-B (BRRi dhan94)	1	3	0	0	1
BR8210-10-3-1-2 (BRRi dhan95)	3	3	0	1	1
BRRi dhan49 (Ck.)	1	3	0	1	1

BB = Bacterial Blight, ShB = Sheath Blight, DH = Dead Heart, WH = White Head. Disease and Insect severity scale (0 – 9).

Table 7. Reaction of the proposed varieties against major diseases and insects under artificial inoculated condition.

Designation	BB	ShB	Blast	BPH	WBPH	GLH
BR-SF(Rang)-PL1-B	5	7	5	7	5	5
BR-RS(Raj)-PL4-B	5	7	5	5	5	5
BR8210-10-3-1-2	5	5	5	7	5	7
BRRi dhan49 (Ck.)	5	5	5	7	5	5

BB = Bacterial Blight; ShB = Sheath Blight, BPH = Brown Plant Hopper; WPH= White Backed Plant Hopper; GLH = Green Leaf Hopper, Disease and Insect severity scale (0 – 9).

similar with BRRi dhan49 and content high amylose (28.0 %) than BRRi dhan49 (24.7) (Table 9). The

physicochemical properties of BRRi dhan93, BRRi dhan94 and BRRi dhan95 are presented in Table 6

Table 8. Distinctness among BR-SF(Rang)-PL1-B (BRR1 dhan93), BR-RS(Raj)-PL4-B (BRR1 dhan94) and BR8210-10-3-1-29 (BRR1 dhan95) with check variety BRR1 dhan49.

DUS Code#	Characteristics	BR-SF(Rang)-PL1-B (BRR1 dhan93)		BR-RS(Raj)-PL4-B (BRR1 dhan94)		BR8210-10-3-1-29 (BRR1 dhan95)		BRR1 dhan49 (Check Variety)		Remarks
		Code	State	Code	State	Code	State	Code	State	
2	Leaf color	3	Dark Green	3	Dark Green	3	Deep Green	2	Green	Distinct
3	Penultimate leaf: pubescence of blade	5	Medium	5	Medium	5	Medium	3	Weak	Distinct
7	Flag leaf: attitude of blade	-	-	3	Semi erect	-	-	1	Erect	Distinct
8	Time of heading (50% of plants with heads)	-	-	-	-	5	Medium (86-105d)	7	Late (106-120d)	Distinct
14	Culm diameter	3	Medium (5.1-6.0 mm)	3	Medium (5.1-6.0mm)	Medium (5.1-6.0 mm)	5	5	Large (6.1-7.0 mm)	Distinct
15	Culm: Length	7	long (81-110 cm)	-	-	-	-	5	Medium (61-80 cm)	Distinct
21	Panicle: number of effective tillers in plant	5	Medium (6-10)	5	Medium (6-10)	5	Medium (6-10)	7	Many (>10)	Distinct
22	Spikelet: Pubescence of lemma & palea	5	Medium	-	-	5	Medium	7	Strong	Distinct
28	Panicle: exertion	5	Just exerted	5	Just exerted	5	Just exerted	9	Well exerted	Distinct
29	Time of maturity	-	-	-	-	5	Medium (116-135d)	7	Late (136-150d)	Distinct
30	Grain: wt of 1000 fully developed grains (at 12%)	3	Low (16-19 g) 18.95g	3	Low (16-19 g) 18.6 g	-	-	5	Medium (20-23 g) 22.9g	Distinct
34	Leaf senescence	1	Late	-	-	-	-	5	Intermediate	Distinct
40	Other distinct special character (if any)	Reddish colored grain		Reddish colored grain		Deep red colored grain		Golden colored grain		Distinct

Table 9. Grain characteristics of the proposed varieties with check variety.

Designation	Milling yield (%)	Head rice yield (%)	Decorticated grain				1000 GW*	ER*	IR*	Protein (%)	Amylose (%)
			Length (mm)	Breadth (mm)	L-B Ratio	Size and shape					
BR-SF(Rang)-PL1-B (BRR1 dhan93)	72.0	65.0	5.1	2.0	2.5	MB	18.95	1.3	3.6	7.5	26.1
BR-RS(Raj)-PL4-B (BRR1 dhan94)	70.0	63.0	5.2	2.1	2.5	MB	18.60	1.2	2.8	7.9	25.7
BR8210-10-3-1-2 (BRR1 dhan95)	68.0	66.0	5.4	2.2	2.5	MB	21.50	1.4	3.5	8.0	28.0
BRR1 dhan49 (Ck.)	69.0	65.0	5.5	2.0	2.5	MB	22.90	1.3	4.3	8.5	24.7

*IR: Imbibition Ratio, ER= Elongation Ratio, GW= Grain weight.

indicates the grain characteristics of these varieties. The paddy and husked rice of BRRI dhan93, BRRI dhan94 and BRRI dhan95 are shown in Figures 4, 5 and 6 respectively.

Conclusion

Swarna type (colored grain) high yielding rice varieties in rainfed lowland rice ecosystem are highly demanding. Newly released BRRI dhan93, BRRI dhan94 and BRRI dhan95 can give 0.5 to 1.0 t/ha more yield than BRRI dhan49 under rainfed lowland rice ecosystem of Bangladesh. Adaptability tests of these varieties under multi-location trials in the farmers' field showed satisfactory performance with respect to grain yield and some yield contributing parameters. It is anticipated that BRRI dhan93, BRRI dhan94 and BRRI dhan95 will contribute to the national Gross Domestic Product (GDP) and also contribute in sustaining food security.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ACKNOWLEDGEMENT

The authors are thankful to technical assistance from scientists of Plant Breeding, Adaptive Research, Plant Pathology, Plant Physiology, Entomology, Grain Quality and Nutrition, Soil Science and Agronomy division of BRRI. BRRI authorities are gratefully acknowledged for providing supports in this research activity.

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