

Research Program 2025-2026

Farm Management Division

Sub-Sub-Program: Rice Production Management

Project Leader: Md. Mamunur Rahman

Project.1. Rice Production Management

Expt.1.1. Surface water utilization for irrigation in the rice seed production field.

Rationale: Water scarcity in the rice research and seed production plots of BRRI H/Q is one of the crucial problems in the recent days. Two pumps are facing problems in operation in the last few months. Though they are now in working condition, but their delivery rate is very much poor (nearly half of their capacity). Therefore, the future irrigation of the research and production plots are in a great threat.

Objectives: To select suitable alternate irrigation water for rice seed production field.

Materials and methods: The experiment will be done in RCB design with three replications in the west byde of BRRI H/Q. The treatment combination will be as follows:

Water sources
1. Drain water from SCA/BARI (southern waste water)
2. Drain water from labor colony (south-west waste water)
3. Drain water from western community (western waste water)
4. Internal drain water of BRRI farm
5. Pond water from East byde pond
6. Underground water

Data to be collected: Heavy metal and other related attributes/contamination/content of water sources. (i) Water quality at 15 days interval (ii) Initial soil sample analysis (iii) Final soil sample analysis (iv) Paddy and straw sample analysis

Location: BRRI farm, Gazipur.

Date of initiation: Boro 2024- 25

PI: Md. Mamunur Rahman

CI: MHB Sazib (GQND), AS Ruma, MR Manir.

Status: New

Expected output: Suitable alternate irrigation water source for rice seed production in BRRI.

Expt.1.2. Efficiency of different sprayer in rice seed production field.

Rationale: BRRI are using traditional sprayer which is operated by hand for spraying of spray materials (insecticides/fungicides etc.). There are some other sprayers developed by BRRI and other companies. These are: battery operated sprayer, solar and battery-operated sprayer, multi nozzle sprayer etc. FMD is planning to compare among these types of sprayers in terms of efficiency, effectivity, user friendliness etc. in the seed production plot.

Objectives: To select suitable sprayer for rice field.

Materials and methods: The experiment will be done in RCB design with three or more replications in the west byde of BRRI. The treatment combination will be as follows:

Sprayer types
1. Normal sprayer (hand sprayer)
2. Battery operated sprayer
3. Solar sprayer
4. Multi nozzle sprayer

Data to be collected: (i) Sprayer efficiency (ha/hr), (ii) Labor efficiency (no. of labor needed for 1 ha spray), (iii) Sprayer effectiveness (spray reaching upto which level). (iv) BCR.

Location: BRRI farm at Gazipur.

Date of initiation: Boro 2024- 25

PI: Md. Mamunur Rahman

CI: MA Hossain (WMM Div), AS Ruma and MR Manir.

Status: New

Expected output: Suitable sprayer for rice field.

Expt.1.3. Enhancing Hybrid Rice Productivity with Mechanical Transplanters: The Role of Planting Density on Yield and Growth

Rationale: Hybrid rice, known for its higher yield potential, has gained importance in addressing the growing global demand for food. The efficient use of mechanical transplanting systems is essential for maximizing productivity, especially in regions with labor shortages or those aiming for large-scale rice production. The spacing between plants is an important factor in rice production, affecting plant growth, resource use efficiency, and ultimately, yield. The BRRI mechanical transplanter is designed for a 30 cm spacing between rows. However, the plant-to-plant spacing can vary, and there is a need to determine how different plant spacings can influence the growth and yield of Hybrid rice. This research will help establish optimal transplanting spacings to improve the mechanization of rice farming, ensuring high yields and cost-effectiveness.

Objectives: To evaluate the effect of different transplanting spacings on the growth, development, and yield of hybrid rice.

Materials and methods: The experiment will be done in RCB design with three suitable replications. The treatment combinations will be as follows:

Control (T_0): 20 cm x 15 cm (Traditional spacing)
 T_1 : 30 cm x 13 cm (Mechanical transplanting spacing)
 T_2 : 30 cm x 15 cm (Mechanical transplanting spacing)
 T_3 : 30 cm x 17 cm (Mechanical transplanting spacing)

Data to be collected: (i) Plant height (ii) Yield (iii) Yield components (iv) HI. (v) LAI at PI and flowering (vi) Mechanical Transplanting Data: Missing hill, Floating hill, Drainage hill, Buriet hill, Total time for transplanting per hectare, Fuel consumption per hectare, Labor input (man-hours/ha) (vii) Economic data

Location: BRRI farm, Gazipur

Seasons: Boro and T. Aman

Date of initiation: T. Aman 2025

PI: Afia Sultana Ruma

CI: MM Rahman, MR Manir, A Ansari (Hybrid Div.)

Status: New

Expected output: To identify the optimal transplanting spacing for Hybrid rice varieties that maximizes growth, yield, and the efficiency of mechanical transplanters.

Expt.1.4. Influence of weed inference period on the performance and profitability of

BRRI dhan89

Rationale: Weed interference is the detrimental effects of weed on crop resulting from their interaction with each other. Weeds are considered as the most harmful pest of crops, and their interaction with crops have considerable consequences on the economy, society, and the environment

Weed is one of the most significant agricultural pests. Invasion of weed is one of the most important causes for low yield of rice. In Bangladesh, weed infestation decreases the grain yield by 70-80% in Aus rice (early summer), 30-40% for transplanted Aman rice (autumn) and 22-36% for modern Boro rice cultivars (winter rice) (BRRI, 2008). A group researcher listed 18 usually growing weed species in aromatic Aman rice cv. Binadhan-9 and identified (Zannat *et al.*, 2014). Islam observed 16 species of weeds belonging to 6 families to grow in conjunction with transplant Aman rice (BRRI dhan49) (Islam, 2014). Jesmin listed 8 commonly growing weed species in Boro rice (Jesmin, 2006).

Weed intrusion period has a considerable influence on weeds and the associated crop performances. Khan observed that weeding rule had significant effect on all parameters except 100-grain weight (Khan, 2003). The high grain yield (6.29 t ha^{-1}) was found from the weed free condition and it produces 37.33% higher yield than the no weeding condition. Average grain yield 4.95 t ha^{-1} under weed free conditions, 3.89 t ha^{-1} with farmers practice (hand weeding at up to 40 DAT) and 3.47 t ha^{-1} in un-weeded controls. Aktaruzzaman reported that weeding regimes exerted significance influence on all the crop characters studied except panicle length (Aktaruzzaman, 2007). Malek observed that the highest plant height (98.04 cm), biological yield (10.79 t ha^{-1}), harvest index (40.88%), grains panicle⁻¹ (101.30), grain yield (4.48 t ha^{-1}), straw yield (6.36 t ha^{-1}), number of total tillers hill⁻¹ (15.32), effective tillers hill⁻¹ (10.91) were found from two weeding at 15 and 30 DAT (Malek, 2008).

In a study stated that crop received weed free treatment up to 60 DAT at which it recorded the least weed density and weed dry weight (Singh *et al.*, 1999). Another group researcher observed that weeding interference period significantly affected all the plant characters (Barietal., 1995). Researchers from Assam reported that different weed control practices significantly reduced the dry matter accumulation of weed and increased the rice yield over the un-weeded control in transplanted rice (Gogoi *et al.*, 2000). A group researchers stated that hand weeding sowing to 40 DAT, weed free control and weedy control, grain yields were 1.86, 1.96 and 0.96 t ha^{-1} , respectively and weed dry weight was 93.8, 10.8 and 217.5 gm^{-2} respectively (Mishra *et al.*, 1985). Rahman reported that weed dry weight increased up to 40 DAT and was at a maximum between 30 to 40 DAT in unweeded plots, reducing the rice yield by 11.01% (Rahman, 1992). A group researcher stated that the highest plant height (111 cm) was produced due to weed free condition and the lowest (87.73 cm) plant height in control plot (Chowdhury *et al.*, 1994).

BRRI dhan89 is the long duration (156 days), high tillering capacity and more than higher yield on the others modern Boro rice varieties. That is why, it is important to examine the effect of weed inference period on the yield and yield contributing attributes of BRRI dhan89. Therefore,

the present research work has been planned and conducted to determine the effect of weed inference period option on the growth, yield and yield contributing character and profitability of BRRI dhan89 under Bangladesh condition.

Objective:

- i. To confirm the best weed inference period for maximizing yield
- ii. To find out the profitable weed inference period

Materials and methods: The experiment will be conducted at BRRI farm, Gazipur during Boro 2024-26. The treatment combination will be as follows:

W₁ = No weeding (Control)

W₂ = Weed free condition (at 12-15 DAT/25-30 DAT/40-45 DAT)

W₃ = Pre emergence herbicides (Bensulfuran methyl + Actachlor) + 1 hand weeding (HW) at 45 DAT (After 2nd urea top dress)

W₄ = Post emergence herbicides (Phenoxlum) + 1 hand weeding (HW) at 45 DAT (After 2nd urea top dress)

W₅ = Pre emergence herbicides (Butachlor) + Post emergence herbicides (Bispyribac sodium)

W₆ = BRRI mechanical weeder at 15 DAT + 1 hand weeding (HW) at 45 DAT

Year of initiation: Boro 2024-26

Year of completion: 2 years

Location: BRRI farm, Gazipur

PI: Mohammad Rezaul Manir

CI: MM Rahman, AS Ruma

Status: Continued.

Expected output: Appropriate weed inference period might be identified for growth, yield performance and profitability of BRRI dhan89.

Expt.1.5. Efficiency of different live traps for rat controlling in rice field.

Rationale: Rat is one of the major rice pests in all over the world causing different level of damages in every field crop (Krebs, Spratt *et al.* 2003; Singleton, Jacob *et al.* 2005; Phung, Brown *et al.* 2010). Rice is damaged by rat in every stages of its growth, especially, from panicle initiation to maturity stage (Krebs, Spratt *et al.* 2003; Phung, Brown *et al.* 2010). On an average around a quarter yield is lost due to rat damage (Singleton, Jacob *et al.* 2005; Phung, Brown *et al.* 2010).

Objectives: To select suitable rat control for rice field.

Materials and methods: The experiment will be done in RCB design with two or more suitable replications in the cites. Rat damage is reported in many national news giving very crucial importance. The experiment will be conducted in BRRI West Byde and East Byde and Farmers field at Gazipur. The treatment combination will be as follows:

Baits of live trap for rats	
1.	Coconut meat
2.	Snail flesh
3.	Aromatic rice
4.	Dry fish (Shutki)
5.	Wheat grain
6.	Cookies biscuits
7.	Cheese
8.	Paddy

Data to be collected: (i) Dates of case use and number of trapped rats date wise.

Location: BRRI farm and farmers field at Gazipur.

Date of initiation: Boro 2024- 25

PI: Md. Mamunur Rahman

CI:M Hossain (Ent Div), AS Ruma and MR Manir.

Status: New

Expected output: Suitable rat control techniques in rice field.

References

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Sub-Sub-Program: Labor Management System

Project Leader: Md. Mamunur Rahman

Project 2: Labour Management System

Expt. 2.1. Monitoring labour wage rate at different locations of Bangladesh.

Objective: To find out the laborers' wage for rice cultivation throughout Bangladesh with food and without food.

Materials and Methods: A pre-set proforma will be used for collecting data.

Location: Different locations of Bangladesh.

Season: Aus, Aman and Boro

Date of initiation: April'2003

PI: Mohammad Rezaul Manir

CI: MM Rahman, AS Ruma, Sirajul Islam and MM Rashid

Status: Continued

Expected output: The average wage rate throughout the year may be higher than previous years

Sub-Sub-Program: Rice Seed Production

Project Leader: Md. Mamunur Rahman

Project 3. Rice Seed Production

Expt.3.1. Comparative study on breeder seed, TLS and rice production system

Rationale: BRRI are producing mainly two types of seeds, such as, breeder seed and TLS. In these production plots the yield are not similar compared to rice production plots due to different management practices, such as, use of different number of seedlings per hill, row and logo system, rouging, harvesting time etc. There is not a specific recommendation on the possibility of yield differences among the different production systems. Therefore, we need to determine the performances of these seed production and rice production systems and need to compare them.

Objectives: To identify performances of different seed production and rice production of different varieties.

Materials and methods: Four BRRI developed rice varieties will be evaluated with three production techniques. The experiment will be done in two factorial RCB design with three replications. The treatment combinations will be as follows:

Treat. 1: Variety		Treat 2: Production system
Boro	T. Aman	
BRRI dhan100	BRRI dhan87	BS
BRRI dhan104	BRRI dhan103	TLS
BRRI dhan105	BRRI dhan75	Rice production
BRRI dhan108	BRRI dhan95	

Data to be collected: (i) Plant height (ii) Yield (iii) Yield components (iv) HI. (v) Tillering dynamics (vi) LAI at PI and flowering (vii) CGR and (viii) RGR.

Location: BRRI farm, Gazipur

Date of initiation: Boro 2024- 25

PI: Md. Mamunur Rahman

CI: AS Ruma, MR Manir.

Status: New

Expected output: Performances of different seed production and rice production system.

Expt.3.2. Performance of BRRI varieties in seed production plots at BRRI Farm

Objectives: To observe potential yield of BRRI varieties

Materials and methods: The data will be collected from the seed production plots at BRRI Farm

Data to be collected:i. Date of sowing, ii. Date of transplanting, iii. Yield and yield components

Location: BRRI farm, Gazipur.

Date of initiation: Boro 2020- 21

PI: Afia Sultana Ruma

CI: MM Rahman, MR Manir.

Status: Continued

Expected output: Actual yield of a variety in farm.

Sub-Sub-Program: Management Activities and Support Services

Project Leader: Md. Mamunur Rahman

Project.4. Management and Utilization of resources

Expt.4.1. Management and Utilization of Land and Labor Resources

Objectives: Efficient utilization of farm land and labor resources of smoothly running of research activities and seed production at BRRI farm.

Materials and methods: Efficient utilization of BRRI land and labor resources, and their management for smoothly running of research and development activities of BRRI.

Location: BRRI farm, Gazipur

Season: Aus, Aman and Boro

Date of initiation and duration: 1985 and this will be done in each year

PI: Md. Mamunur Rahman

CI: MR Manir, AS Ruma

Status: Continued

Expected output: Better outcome from farm land, labor and smooth operations of farm implements.

Expt.4.2. Management and Support Services of BRRI

Objectives: Efficient utilization of resources for smoothly running research activities and other activities of BRRI.

Materials and methods: Management and Support service activities of BRRI are carried out by FMD. It is one of the most common and regular activity of this division. The activities are:

1. Garden management
2. Beautification of BRRI
3. **Graveyard management**
4. **Playground management**
5. **Mosquito control activities**
6. **Tree plantation**

PI: Md. Mamunur Rahman

CI: MR Manir, AS Ruma,

Status: Continued

Expected output: Smooth management and attractive office premises.