

**Research Achievement 2006-2007
(Technology Development)**

Technology Developed				How Country/Farmer/User will be benefited																																			
<p>1. BRRI dhan46: A delay planting variety for T. Aman</p> <p>The demand is to develop a variety similar to BR11 type but adaptable to delay planting to mid September. BRRI dhan46 has met the demand.</p> <table border="1"> <thead> <tr> <th rowspan="2">Variety</th> <th rowspan="2">Yield (t/ha)</th> <th rowspan="2">1000 gr. wet (g)</th> <th colspan="3">Decortiations grains properting</th> </tr> <tr> <th>L(mm)</th> <th>B(mm)</th> <th>L:B ratio</th> </tr> </thead> <tbody> <tr> <td>BRRI dhan46</td> <td>4.7</td> <td>25.2</td> <td>5.2</td> <td>2.5</td> <td>2.1</td> </tr> <tr> <td>BR22 (ck)</td> <td>4.1</td> <td>19.7</td> <td>5.3</td> <td>2.2</td> <td>2.4</td> </tr> <tr> <td>Nijershil (ck)</td> <td>3.4</td> <td>19.2</td> <td>5.8</td> <td>2.1</td> <td>2.8</td> </tr> <tr> <td>BR11</td> <td></td> <td>24.6</td> <td>5.2</td> <td>2.4</td> <td>2.1</td> </tr> </tbody> </table>				Variety	Yield (t/ha)	1000 gr. wet (g)	Decortiations grains properting			L(mm)	B(mm)	L:B ratio	BRRI dhan46	4.7	25.2	5.2	2.5	2.1	BR22 (ck)	4.1	19.7	5.3	2.2	2.4	Nijershil (ck)	3.4	19.2	5.8	2.1	2.8	BR11		24.6	5.2	2.4	2.1	<p>High yielding and delay planting variety is available to farmers for flood prone/double cropping areas in T. Aman season.</p>		
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<p>2. BRRI dhan47: A salt tolerant variety</p> <p>The variety is recommended for saline areas in Boro season. Its salt stress tolerant capacity is 12-14 dS/m at seedling stage. The variety can complete life cycle up to 6 dS/m. It has yield potential about 6.0 t/ha and matured within 150 days.</p>				<p>Horizontal Boro area will be increased by the adoption of BRRI dhan47 at saline prone coastal areas.</p>																																			
<p>3. Molecular identity of BRRI variety</p> <p>DNA finger printing is employed for 79 SSR markers and developed molecular identity card of BR1, BR2, BR3, BR7, BR9, BR10, BR17, BR18, BR19 and BR20 (e.g. BR7).</p>				<p>DNA markers will help prevent from piracy of BRRI variety.</p>																																			

IDENTITY CARD <u>BR7</u>		
Morpho-physicochemical Characteristics		
Season	Boro and Aus	
Height	125 cm	
Life Cycle	155 (boro) and 130 (aus) days	
Kernel size	Long slender	
Grain Colour		
Yield	4.5 tons/ha (boro and aus)	
Diseases	Moderate Resistant to Tungro	
Milling outturn	70%	
Protein	8.0 %	
Amylose	22 %	
Cooking	16 minutes	

BRRi dhan29 GR (Golden Rice)
 BRRi dhan29 has been transformed with beta carotene synthesis gene (vitamin A) from daffodil via soil born bacteria *Agrobacterium tumefaciens* in collaboration with IRRI. Two transgenic lines viz. IR83493TRN 3-7 (BRRi dhan29 GR-1) and IR83493TRN 11-3 (**BRRi dhan29 GR 2**) of event 1 were grown at BRRi contentment facility. Two entries were more or less similar but differ from the original BRRi dhan29 in polished grain condition. Appearance of yellowish colour in grain witness is the presence of vitamin A. The mature plants and polished grains of the test materials are shown below.


Rice cannot synthesize β -carotene (precursor of vitamin A). β -carotene synthetic pathway is introgressed in BRRi dhan29. Therefore, vitamin A rich rice is available that prevent diseases related to vitamin A deficiency.

IR83493TRN3-7 BRRi dhan29 IR83493TRN3-7

Development of Hybrid Rice
 Two new hybrid rice combinations (BRRi 1A/BR 168R & BRRi 10A/BRRi 10R) were developed for Boro season. The parents of these hybrid combinations are developed from BRRi sources. These hybrids showed 1.1-1.5 t/ha yield advantage over BRRi dhan29 with growth duration of 150 days.

Development national hybrid rice.

<p>4. Management of aged seedling after transplanting</p> <p>Often times, farmers do not have options but to transplant aged (50-70 days old) seedlings in T Aman season. Recommended management showed about 1.0 t/ha yield reduction but a balance dose of 80 kg N/ha at 7-10 DAT and 40 kg N/ha at PI stage can boost up the yield of aged seedling crop similar to normal (30 day old) seedling.</p>	<p>Yield loss could be minimized when there is a shortage of young seedlings for transplanting by N management.</p>
<p>5. Check valve attachment on STW</p> <p>Starting of STW always a different task. An attachment of a check valve has made the task a comfortable start of STW. It costs 1000/- per STW.</p>	<p>Installation of check valve reduced the drudgery of farmers for starting of STW.</p>
<div data-bbox="256 684 813 1115" data-label="Image"> </div> <p>Attachment of check valve in STW.</p>	
<p>6. Conjunction use of river water in coastal areas</p> <p>Rice cultivation is hindered due to saline soil and STW water in Boro season at coastal areas. River water salinity in these areas remain <4.0 dS/m up to mid-February. Therefore, river water resources could be used for irrigation during neap tide without incurring any cost for pumping up to mid February. And intelligently river water can be conserved in natural canals by sluice gates at that time and irrigate Boro rice up to end of March. This consume water management practice could be popularized for successful Boro rice cultivation in the coastal region.</p>	<p>Boro rice cultivation could be increased in the Coastal areas, which increase the productivity of saline prone coastal areas.</p> <div data-bbox="870 1453 1365 1862" data-label="Image"> </div> <p>Boro rice cultivation using neap tide water in coastal area.</p>

<p>7. Poultry litter as manure</p> <p>Application of poultry litter @5.0t/ha (wet) or @ 2 t/ha (dry) basis in combination with LCC or STB fertilization maximized rice yield in T. Aman and Boro seasons. These doses of poultry litter can supplement the full dose of P, S and 50% K and 20% of N requirement for rice crop. Thus it saves the fertilizer cost and improves nutrient availability for enhancing yield.</p>	<p>Environment friendly and low cost technology for increasing rice production and savings of chemical fertilizers.</p>
<p>8. Identification of resistant donor</p> <p>BPH resistant donors: i. IR70175-25-1-1-2-1; ii. IR71604-4-1-4-7-10-2-1-3; iii. IR71698-193-3-2-1; iv. IR72890-70-2-3-3. v. IR72892-77-2-2-2; vi. IR73545-3-1-1-2. vii. IR74271-41-2-1; viii. IR77495-10-2-6-2. ix. Dudhsar and , x. Malia Bhangor. GLH resistant donors: i. Gabura; ii. Suna Digha (2); iii. Kashia Binni (2) and; iv. Ganjia. WBPH resistant donors: i. Malia Bhangor and; ii. SR-26-B.</p>	<p>Rice germplasm available for developing insect resistant rice varieties that will help in the conservation of natural enemies of rice pests, reduce environmental pollution and production cost.</p>
<p>9. Bakanae disease management</p> <p>Seed treatment with Bavistin, Knowin or Haydazim at the rate of 3 g per litre water for one Kg seed and soaked for overnight.</p> <p style="text-align: center;">Or</p> <p>Root dipping of seedlings for overnight in 0.3% suspension of Bavistin, Knowin or Haydazim before transplanting can control bakanae disease effectively.</p>	<p>Rice yield loss could be minimized through effective control of Bakanae disease.</p>
<p>10. Development of flat bed batch dryer</p> <p>One ton capacity dryer was designed and fabricated. Freshly harvested paddy (18.3% moisture content) needs 7 hours to dry at 13.6% moisture. Fuel consumption (of the kerosene burner) was 1.25 - 1.50 liters per hour. The drying rate is 0.67% per hour.</p> 	<p>This dryer will help the farmers to save their crop from inclement raining weather.</p>

11. Modification of micro rice flour mill



Dheki has been known the machine for rice flour in the villages. For hygienic and dust free flour production the micro flour mill was modified and replaced with 4 hp diesel engine successfully matching the farmer's demand. Sensory evaluation of flour was done by taste panel with positive results. Its particle size distribution was similar to Dehki.

Micro rice flourmill will help the villagers to take it as alternate income generating source.

12. Monga mitigation model

The theme is to introduce crop diversification for creating employment opportunity to day laborers and food availability to marginal/small farmers-during early October-mid November that called Monga period.

Because of largely growing long duration rice variety in T. Aman, labour employment becomes the lowest and the crop started to mature from mid November. Thus Monga is developed greater Rangpur districts. The replacement of long duration rice variety with short e.g. BRRI dhan33 can start harvesting in early October conceded with early rabi crops and thus day labourer's employment and food availability happens to take place. Four cropping patterns are being successfully fitted in monga areas in northern Bangladesh.

1. BRRI dhan33- Potato-Boro.
2. BRRI dhan33- Mustard – Boro.
3. BRRI dhan33- Potato- Maize.
4. BRRI dhan33- Wheat- Mung bean.

Crop based tools for addressing monga that are easy and accessible to the farmers.