Only 43 cultures (26 fine and 17 coarse) at Jalalabad and 21 cultures (11 fine and 10 coarse) at Baghlan matured normally. Others did not ear at all or were very late and recorded very high sterility.

IRRI fine-grain cultures yielded 4% to 395% more at Jalalabad and from 2.4% to 112.3% more at Baghlan. The three highest-yielding cultures at Jalalabad were IR1628-632-1, IRl529-680-3-2, and IR1721-11-6-8-3-2 (Table 1). At Baghlan they were IR1561-228-3-3, IR1561-238-2, and IR1561-152-1. IR1561-228-3-3 and IR1561-238-2 yielded an average of more than 6 t/ha at both sites. Promising fine-grained cultures are being evaluated for qualities similar to those of local varieties.

IRRI coarse-grained cultures yielded from 47.28% to 163.5% more at Jalalabad and from 15.14% to 63.6% more at Baghlan (Table 2). Three cultures, IR747B_2-4-2-1-1, IR934-10-1-2-2, and IR934-239-1-3-2, yielded an average of more than 6 t/ha at both sites. Promising coarse-grained varieties are being tested in demonstration plots in farmers' fields. ■

Table 2. Performance of the best coarse-grained IRRI cultures in varietal trials at Jalalabad and Baghlan, Afghanistan.

Culture	Yield (t/ha)	Increase	
		t/ha	%
	Jalalabad		
IR747 B2-4-2-1-1	6.2	2.3	59.4
Local variety	3.9		
IR934-10-1-2-2	8.4	4.4	107.4
Local variety	4.0		
IR934-239-1-3-2	8.4	5.2	163.5
Local variety	3.2		
	Baghlan		
IR747 B_2-4-2-1-1	7.2	2.8	63.6
Local variety	4.4		
IR934-10-1-2-2	6.8	2.2	48.1
Local variety	4.6		
1R934-239-1-3-2	6.1	1.5	34.0
Local variety	4.6		

Low input variety BIET1107 for rainfed lowland areas of Bihar, India

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The average fertilizer consumption of a rice crop in Bihar is high — about 4 kg N/ha. A number of factors, including the economic condition of the farmers, are responsible.

BIET1107 is the result of efforts to breed varieties for low inputs. BIET1107 (from the cross Jaya/Mahsuri), had the designation RAU 51-57-1 before its release in 1981. In more than 5 years of varietal trials, recommended practices for low input varieties (40-50 kg N/ha) were used. Yield superiority was consistent (Table 1) over years and across sites. Under rainfed lowland conditions during 1979 and 1980, BIETl107 yielded an average 3.4 t/ha, compared with 2.5 t/ha of BR34, 2.2 t/ha of Mahsuri, and 1.8 t/ha of BR8. BIET1107 is also recommended as a substitute for varieties such as BR8, BR34, and Mahsuri in rainfed areas of medium lowlands. Beginning in 1978, BIET1107 showed its superiority over existing varieties in more than 815 minikit demonstrations in farmers' fields.

BIET1107 has intermediate height (135 cm) and good tillering ability. Its resistance to bacterial blight is moderate but better than that of Mahsuri. Grains are medium slender with quality comparable to Mahsuri's (Table 2), making BIET1107 acceptable to farmers and consumers. ■

Table 1. Average yield of BlETll07 under low input irrigated conditions at 5 sites in Bihar, India, 1976-80.

Entry	Av yield (t/ha)				
	Patna	Bikram ganj	Sabour	Pusa	K anke
BIET1107	4.7	4.2	4.0	2.4	2.5
BR34	3.2	2.8	3.4	2.2	2.3
Mahsuri	4.5	3.5	4.2	2.1	2.7
BR8	3.2	2.6	3.3	2.6	2.5

Table 2. Grain quality characters of BIET1107 and check varieties in Bihar, India.

Entry	Grain length (mm)	Length-breadth ratio	Hulling (%)	Head rice recovery (%)	Protein (%)	Cooking quality
BIET1107	5.1	2.6	73.4	63.3	7.0	Good
BR34	6.0	2.9	72.4	59.2	9.1	Good
Mahsuri	5.3	2.7	74.5	65.2	8.7	Good
BR8	6.8	3.0	71.2	58.2	7.2	Good

GENETIC EVALUATION AND UTILIZATION

Agronomic characteristics

Angle of leaf attachment in rice varieties

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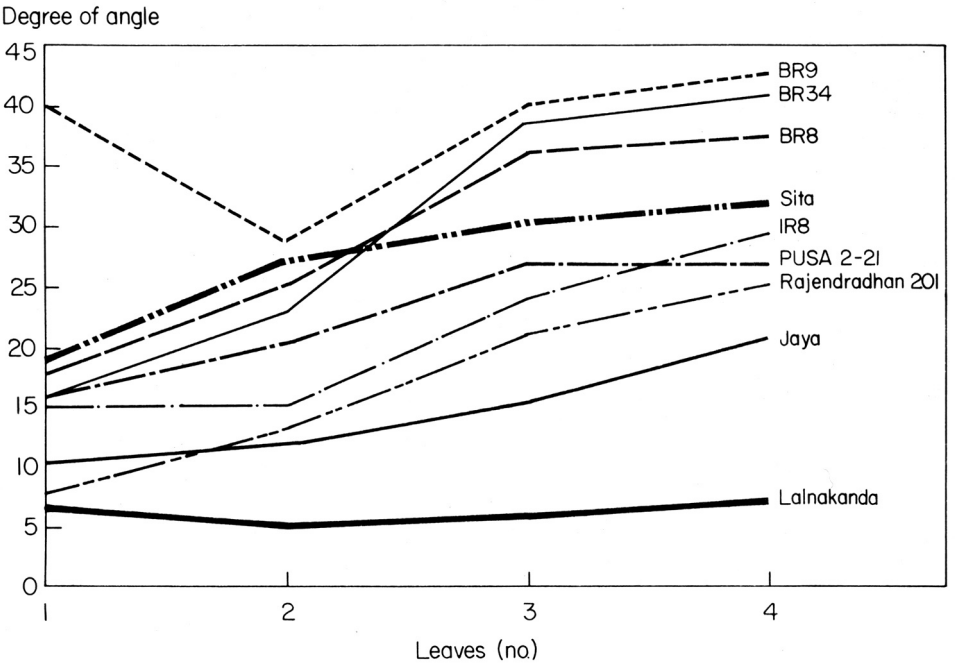
The angle a rice leaf blade makes at its base (collar) is influenced largely by leaf length. The wider the angle, the more the spread of leaves for light interception, especially in the lower leaves. This defect has largely been corrected in semidwarf lines where leaves are shorter than in tall varieties and form closer angles at the base. But overlapping still occurs in the lower leaves. In the ideal plant type, interception of light would be low. One way to achieve this is to develop rice plant types with minimum leaf attachment angles.

Lalnakanda is a tall variety with long leaves and acute leaf attachment angles. A study compared some selected tall (BR34, BR8, BR9) and semidwarf (Jaya, Sita, Pusa 2-21, RD1, and IR8) varieties and Lalnakanda. Varieties were grown at 20- × 20-cm spacing with 80-40-20 kg NPK/ha. Four leaves were

taken from the top of 100 random tillers at the postflowering stage.

Leaves of tall varieties had wider leaf attachment angles than dwarf varieties (see figure). The difference is clear in the second and third leaves. But all leaves of Lalnakanda had closer angles than did dwarf varieties. Incorporation of acute leaf attachment angle in short-leaved dwarfs could result in better plant types where light interception would be less. Plant populations per unit area could be increased without adversely affecting photosynthetic rates. The trait is linked with a simply inherited rudimentary juncture condition and could be incorporated easily into the desired plant type. ■



Angles of leaf attachment of different rice varieties observed at Bhagalpur, India.

GENETIC EVALUATION AND UTILIZATION

Grain quality

A preliminary study on the specific gravity of rice grain

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Most Sri Lankans prefer red rices. But with the introduction of high yielding varieties, the number of red rice varieties in cultivation has decreased considerably. A preliminary study used specific gravity to compare rice color and grain weight.

Twenty rice varieties (10 red and 10 white), including both recommended varieties and elite lines, were grown under identical conditions during the 1980 dry season. Rice yield was dried in the shade to 14% moisture. Fifteen-gram samples from both brown rice and polished rice were drawn. Grain weight was determined by the specific gravity bottle method using kerosene oil.

Results suggest that the specific gravity of white rice is significantly higher than that of red rice (see table). Polishing increased the specific gravity, which could be attributed to removal of the high fat content of the bran.

Yield is the primary objective in varietal improvement work in Sri Lanka. It is possible that the reduction in the number of red rice varieties grown is due to an unconscious selection against red grains, which have a lower weight than white. ■

Specific gravity measurements of rice in Sri Lanka.

Specific gravity [a]			
Red rice		White rice	
Brown	Polished	Brown	Polished
1.4000	1.4260	1.4120	1.4390

t-value [b] for color (red & white):
Brown rice = 2.942**
Polished rice = 3.106**

Milling (brown & polished):
Red rice = 5.733**
White rice = 5.978**

[a] Mean of 10 samples. [b] **significant at .01 level.

Individuals, organizations, and media who wish additional details of information presented in IRRN should write directly to the authors.

Breeding high-quality and high-yielding varieties of rice in Afghanistan

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Rice consumers in Afghanistan are quality conscious. Local varieties are high quality, with long, slender, translucent grains that cook into excellent plaw or biriani. Two very popular varieties, Barah and Lawangin, are grown extensively in the northern and the eastern areas. They are tall growing with weak straw and poor response to fertilization; hence productivity is low.

To increase yield potential, the two local varieties were crossed with a high yielding culture; IR790-28, at IRRI. Bulk seed for growing the F_3 was received in 1973. Selection of desirable recombinants was carried out in F_3 to F_6 plants grown under high-level fertility (120-60-60 kg NPK/ ha) at the Pos-i-Shan Agricultural Research Station at Baghlan.

Thirty high-yielding cultures from IR790-28/ Barah and 37 cultures from IR790-28/Lawangin met the quality