Reaction of Punshi and Phouoibi to leaf blast and gall midge in Manipur, India, 1979.[a]

Subdivision	Punshi		Phouoibi		IR24 (check)		Phouren (check)	
	SS (%)	Blast score	SS (%)	Blast score	SS (%)	Blast score	SS (%)	Blast score
Imphal West I	22.04	2-3	26.78	1-4	43.58	1-3	9.60	0-1
Imphal West II	12.71	5-6	14.19	3-4	10.80	3-5	3.92	0-3
Imphal East	32.44	3-4	26.05	1-4	29.32	2-4	6.19	1-2
Thoubal	23.85	4-5	38.33	3-6	23.26	2-6	5.07	0-1
Bishenpur	14.98	3-6	16.89	3-5	9.36	2-4	6.46	0-2

[a]SS = silvershoot. Blast score is by the 1980 Standard Evaluation System for Rice.

midge (see table). Further field observations later confirmed their susceptibilities.

In addition, Punshi is occasionally infected, from nursery to late tillering stage, with leaf scald caused by *Rhynchosporium oryzae.* Standard Evaluation System for Rice (1980) scores range from 3 to 5.

Bacterial blight resistance in donor varieties having other desirable traits

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To isolate a multiple donor variety for bacterial blight (BB), stem rot (SR), brown planthopper (BPH), stem borer (SB), and blast (Bl) for use in the breeding program, 30 desirable varieties were tested for reactions to BB. The experiment was conducted under artificial epiphytotic conditions at Haryana Agricultural University, May-October 1981.

Two 5-m-long rows of each variety were artificially inoculated at maximum tillering. Inoculation was done by cutting 5 cm of the upper leaf portion with a sickle dipped in a single-isolate inoculum. The inoculum was prepared by soaking small pieces of naturally infected leaves in water for 20 minutes.

Disease reactions were compared 15 days after inoculation. The standard IRTP evaluation (scale 1-9) was used. Disease intensity had reached 9 in susceptible varieties.

BJ 1 and DV 85 showed resistance and appeared to be a suitable donor for BB. Dasal, FR 43B, Mahsuri, IET 4141, Chuigak-45, TKM6, LZN, UPRB 30 and 31, and CB 1 were moderately resistant. Three varieties had intermediate resistance. All others tested were susceptible to BB (see table). These studies showed varieties TKM6 and BJ 1 are resistant to BB. They also have desirable grain character and plant type.

Reaction of various donor varieties to bacterial blight at Karnal, India.[a]

Variety	Donor for	Other desirable trait(s)	Reaction to BB[b]
CH 1039	High altitude	–	5
Patnai 23	Salt resistance	Resistant (R) to Bl, BS, SB	9
Dasal	Salt resistance	–	3
Getu	Salt resistance	Tolerant (T) of salinity	5
SR 26 B	Salt resistance	–	7
Basmati-370	Salt tolerance, SR resistance	R to Bl	7
Jhona 349	Alkali tolerance	–	9
FR 43B	Flood resistance	–	3
FR 13A	Flood resistance	R to SR	7
Mahsuri	Lowland	–	3
Jagannath	Lowland	–	7
Lalnakanda 41	Upland, drought tolerance	–	9
MTU 17	Upland, drought tolerance	–	9
Kataribhog	RTV	–	9
Latisail	RTV	–	9
ARC 6650	BLS resistance	R to BPH, WBPH, RTV	7
IET4141	BB resistance	–	3
Chuigak-45	BB resistance	–	3
DV 85	BB resistance	–	1
TKM6	BB and SB resistance	R to Bl, RTV, GLH, BPH, SSB, SR	3
BJ 1	BB resistance	R to Bl, BLS, SB	1
LZN	BB resistance	R to Bl	3
UPRB 30	BB resistance	–	3
UPRB 31	BB resistance	R to Bl	3
IR8	Bl resistance	–	7
Carreon	Bl resistance	R to BLS	7
Tadukan	Bl resistance	R to BLS	5
CB 1	SB resistance	–	3
Siam 29	GM resistance	R to B1, BLS	9
CR94-721-3	GM	–	7

[a]Bl = blast, BB = bacterial blight, BLS = bacterial leaf streak, BPH = brown planthopper, BS =brown spot, GLH = green leafhopper, GM = gall midge, SB = stem borer, SR = stem rot, SSB = striped stem borer, RTV = rice tungro virus, – = not tested. [b]On a scale of 1-9: 1 = resistant, 9 = susceptible.

Seedling age and incidence of rice dwarf

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Rice dwarf (RD), the only rice virus disease presently reported in Nepal, is transmitted by the green leafhopper *Nephotettix nigropictus.* RD also occurs in Japan, Korea, and Taiwan.

A greenhouse experiment, conducted at Khumaltar Agriculture Station, Kathmandu, Nepal, in July 1981, examined the effect of rice seedling age on

disease incidence. Seedlings aged 25 and 45 days were separately inoculated with virus. Results indicated RD incidence was higher in 25-day-old seedlings (see table). On average, 69% of seedlings became infected when inoculated at 25 days. Only 26.8% of seedlings were infected when inoculated at 45 days. NR6-5-16-18B_1 and NR6-5-46-48 showed higher percentage of infected seedlings when inoculated at 45 days. IR3707-117-2 was disease-free at both ages.

This study suggests rice seedlings build resistance to RD as age increases. Age specificity of disease incidence shown by some cultivars (see table) indicates resistance to this virus may depend on crop growth stage. CH45 showed 100% infection in both inoculation stages. It can be used as a good susceptibility check for RD varietal screening in Nepal.

Effect of seedling age on rice dwarf incidence at Khumaltar, Nepal, July 1981.

Cultivar	25-day-old seedlings		45-day-old seedlings	
	Inoculated (no.)	Infected (%)	Inoculated (no.)	Infected (%)
IET2938	10	20	9	11
IR2061-628-1	9	56	10	10
Chandina	8	100	10	70
BG94-1	7	57	10	40
CH45	10	100	10	100
NR6-5-46-45	10	100	10	90
IR2070-414-3	10	70	10	10
IR2071-124-6-5	10	80	10	0
IR2071-586-5-6	10	70	10	40
BR4	8	50	9	0
BR51-91-6	10	80	10	10
IR2797-125	10	33	8	0
NR6-5-16-18B_1	10	50	10	70
IET4183	6	50	10	10
IR3707-117-2	10	0	10	0
IR3941-25-1	9	89	10	0
IET1444	8	75	10	40
Se 322-G-19	10	100	10	20
IR2061-522-6-9	8	88	10	10
NR6-5-46-48	10	30	8	50
NR6-7-83-46	10	100	10	40
BG374-2	9	89	10	10
BC374-1	10	100	10	20
IET4094	11	91	10	20
IR22	10	40	9	0
Mean		69		27

GENETIC EVALUATION AND UTILIZATION

Insect resistance

Reactions of some Korean rice varieties to brown planthopper biotype 2

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Susceptibility of rice varieties with or without *Bph 1* gene for resistance to brown planthopper biotypes 1 and 2 was studied in the greenhouse.

Resistant Korean cultivars and susceptible varieties were screened at different days after infestation (DI) using the seedling bulk test. Pungsanbyeo (without resistance gene), Baekunchalbyeo (*Bph 1*), and Milyang 63 (*bph 2*) were

Table 1. Reactions of selected rice varieties to BPH biotypes 1 and 2 at seedling stage at different days after infestation. Korea, 1981.

Variety	Resistance gene	Damage rating[a] at given days after infestation							
		Biotype 1				Biotype 2			
		9	11	13	15	9	11	13	15
Pungsanbyeo	None	MR	MR	M	M	R	R	MR	M
Iri 358	”	MS	S	S	S	R	MR	MS	MS
Milyang 23	”	MR	MR	MS	MS	R	MR	M	M
Suweon 307	”	S	S	S	S	MR	MR	MS	S
Baekunchalbyeo	*Bph 1*	R	R	R	R	M	S	S	S
Milyang 58	”	R	R	R	R	MS	S	S	S
Milyang 60	”	R	R	R	R	M	MS	S	S
Hangangchalbyeo	”	R	R	R	R	MR	MS	S	S
Milyang 61	”	R	R	R	R	MR	MS	S	S
Milyang 57	”	R	R	R	R	M	M	MS	S
Suweon 309	”	R	R	R	R	MR	M	MS	S
Milyang 55	”	R	R	R	R	R	MR	MS	S
Milyang 56	”	R	R	R	R	R	MR	MS	S
Iri 352	”	R	R	R	R	MR	MR	MS	S
Nampungbyeo	”	R	R	R	R	R	MR	M	M
Cheongcheongbyeo	”	R	R	R	R	R	MR	M	S
Iri 357	”	R	R	R	R	R	MR	M	M
Milyang 30	”	R	R	R	R	R	MR	M	M
Milyang 63	*bph 2*	R	R	R	R	R	R	R	MR

[a]Based on seedling bulk test: R = resistant, S = susceptible, MR = moderately resistant, MS = moderately susceptible.