

nated with aflatoxin B₁ (see table). The level (0.234 ppm) detected in parboiled (brown) rice collected from Peradeniya was much higher than the tolerable level (0.01 ppm) in developed countries. The natural contamination of rough rice

BG34-8 and BW265 could indicate a higher susceptibility of new improved varieties to toxigenic strains of *Aspergillus*.

Twelve rice varieties tested for susceptibility at moisture content 30% were

artificially inoculated with two toxigenic strains of *A. flavus* and *A. parasiticus*. All 12 were susceptible. They also produced very high levels of toxins (above 0.300 ppm) in 2 weeks of incubation at 25°C. ■

GENETICE EVALUATION & UTILIZATION

Disease resistance

Leaf scald disease of rice in Andhra Pradesh

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During a disease monitoring tour to RRRS, Nellore, in February 1981, leaf scald disease caused by *Rhynchosporium oryzae* Hashioka and Yokogi was observed in many rice varieties on the farm. Disease-affected specimens were collected, the causal organism was isolated, and its pathogenicity was confirmed at AICRIP, Hyderabad. On the

basis of all morphological characters, the fungus is identical to what Ou described in 1972.

The conidial suspension of the fungus was prepared from 7-day-old streaked culture on potato dextrose agar in petri dishes. Two susceptible varieties — TN1 and EUP-1582 — (known from the earlier work with the Ponnampet isolate of the pathogen) were grown in pots. When the plants were at panicle initiation stage, they were inoculated with the clip inoculation method and then kept in humid chambers for 72 hours. Five days after inoculation, 2- to 3-mm-long water-soaked lesions at the clipped ends of leaves were observed. The lesions gradually moved downwards and within

12 days covered 12-15 cm of the leaf blade, turning straw color with transverse banding. From the fresh advancing lesions, the fungus was reisolated and identified as *R. oryzae*. This is the first record of leaf scald occurrence in Andhra Pradesh.

Various experimental trials have shown the following varieties or cultures as susceptible to leaf scald disease at Nellore: NLR 11214, NLR 10859, NLR 18235, NLR 18161, NLR 17906, NLR 17039, NLR 16696, NLR-T 197, RNR 89128, RNR 36178, RNR 87877, K H 998, Rajendra, KLN H 361-1-1-6-2, KLN H 36, MTU 6099, MTU 5249, MTU 5283, MTU 5410-9, CR 181-62-15, CR 42-10-231, RP 1033-43-2, PS 1-44-624, IR20, IR34, BPT 1235, IET 6844, IET 7532, IET 6069, IET 6097, IET 6560, IET 7041, IET 6661, IET 6896, IET 7237, and IET 7042. ■

Disease reaction of advanced rice cultures

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In Kuttanad, the rice bowl of Kerala, 100% coverage of high yielding rice varieties has been achieved. Severe incidences of sheath blight disease caused by *Rhizoctonia solani*, sheath rot disease caused by *Acrocyndrium oryzae*, and bacterial blight caused by *Xanthomonas oryzae* occur in the area. To develop varieties that can tolerate those diseases, rice cultures developed at the RRS, Moncompu, were evaluated.

The cultures were screened repeatedly for 2 years in the field and in the greenhouse, and artificial inoculations by standard techniques were done. Disease intensity was scored by the IRRS Standard Evaluation System for Rice scales, 2 weeks before harvest. The mean disease

Disease reactions^a of advanced rice cultures. Rice Research Station, Moncompu, Kerala, India.

Culture of Variety	Mean sheath blight score	Mean sheath rot score	Mean bacterial blight score
M11-57-5-1 ^b	1.25	2.20	0.35
M1544-2	2.62	3.67	2.75
M15-36-2 ^c	0.00	2.95	5.15
M1537-2	2.00	1.85	2.10
M23-100-2-2	1.36	1.20	1.15
M23-16-1-1	1.35	1.05	1.35
M23-17-1-1	0.25	0.85	1.37
M23-69-1-1	0.60	0.45	1.35
M23-69-1-1-1	3.95	1.75	0.65
M23-74-1-2-1	2.07	2.57	1.97
M23-17-1-3	4.12	2.50	2.47
M23-69-1-2	2.35	2.42	1.80
M23-83-1-1	1.37	2.80	0.35
M22-65-2-4	2.02	4.25	1.62
M22-184-1-1	1.50	3.92	2.50
M14-59-2	1.42	3.35	2.47
M23-74-1-1	0.70	2.22	1.62
M24-211-1	0.67	3.17	1.85
M1537-1	1.15	3.00	1.45
M22-67-3-2	1.62	2.70	2.40
Jyothi (susceptible check)	4.12	2.70	4.52
TN1 (" ")	2.67	3.32	4.21

^aScored by the 1980 Standard Evaluation System for Rice scales of 0-9. ^bReleased as Bhadra during 1978. ^cReleased as MO 5 during 1980.

scores recorded for each entry are in the table.

M15-36-2 (MO 5), M23-17-1-1, M23-

69-1-1, M23-74-1-1, and M24-211-1 showed good tolerance for sheath blight (score < 1); M23-17-1-1 and M23-69-1-1

were found to tolerate sheath rot (score < 1); M11-57-5-1 (Bhadra), M23-69-1-1-1, and M23-83-1-1 tolerated bacterial blight (score < 1).

M23-17-1-1 and M23-69-1-1 were found to possess tolerance for both sheath blight and sheath rot, diseases that are serious in the area. ■

Varietal response to bacterial blight and stem rot under artificial epiphytotic conditions

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Two experiments tested 56 varieties and lines at the Rice Research Station, Kaul, during May-October 1980. In the first experiment, the yields of 11 promising high yielding varieties and lines were

compared with those of cultivars Jaya and Palman 579. The entries were planted in 15-m² plots in a randomized block design with 3 replications. Two rows of the susceptible check TN1 were planted between two consecutive plots. In the second experiment, 43 varieties and lines were planted in 3-m-long 2-row plots to identify a resistance source for bacterial blight (BB) and stem rot (SR).

BB inoculation was at maximum tillering. The upper 5-cm leaf-tip portions were cut with a sickle dipped in inoculum prepared by soaking pieces of infected leaves in water for 20 minutes. SR inoculation was done in the laboratory on excised internodes (with intact nodes at both ends) collected at flowering stage by the cut-stem wound method.

Observations on intensity of BB and SR were recorded after 14 and 10 days, respectively, in accordance with standard methods. Under BB stress, IET4141, IR36, and Prasad yielded 5.85, 5.59, and 5.54 t/ha or 32% 26%, and 25% more than the check variety Jaya.

IET4141 and Prasad were resistant to SR, IR36 and HAU-6-163 were susceptible. IR36 and Prasad matured 11 days earlier than IET4141. Grain sterility ranged from 5.02 to 12.65 in resistant varieties and 13.54 to 51.89% in susceptible ones (Table 1).

In the second experiment, 16, 22, and 5 entries had resistant, susceptible, and intermediate reactions to SR, and 8, 12, and 14 entries had resistant, susceptible, and intermediate reactions to BB. Damodar and CR206-6176-260 were resistant to both diseases (Table 2). ■

Table 1. Performance of high yielding strains or varieties under high bacterial blight stress at Kaul, India.

Strain or variety	Pedigree	Reaction ^a to		Days to		Grain sterility (%)	Yield ^b (t/ha)
		Bacterial blight	Stem rot	50% flowering	Maturity		
RP633-519-3-8-1-1 (IET4141)	(IR8/BJ 1 43)//IR22	3	1	118	151	12.65	5.85 a
IR36	(IR1561-228)/(IR24/ON)//CR94-13	3	9	105	140	8.14	5.59 a
Prasad	(IR747 B ₂ -6/IR579-48)	3	1	106	140	5.02	5.54 ab
HAU 6-163	Jaya/Palman 246	9	9	106	141	30.63	4.96 abc
CR167-10 (IET4096)	Ratna/Early prolific	5	5	107	142	13.54	4.79 bc
Palman 579	IR8/Tadukan	5	1	105	140	14.86	4.49 c
HAU 1-38-1-1	Jaya/Jhona 349	9	9	105	140	38.19	4.43 cd
Jaya	TNI/T141	9	9	112	146	17.95	4.43 cd
PR 106	IR8/(F'eta S/Bellepatna)	9	1	112	146	15.08	4.30 cde
6473 (IET2729)	-	7	3	110	143	27.18	4.24 cde
6475 (IET2730)	-	5	1	110	143	21.71	4.15 cde
HAU 2-97-1	Jaya/Jhona 351	9	5	94	129	41.99	3.42 de
HAU 1-227-1	Jaya/Jhona 349	9	9	96	131	51.89	3.15 e

^aBased on the Standard Evaluation System for Rice scales. ^bMeans followed by a common letter are not significantly different at the 5% level.

Table 2. Reaction of lines or varieties to stem rot and bacterial blight at Kaul, India.

Line or variety	Pedigree or origin	Reaction ^a to	
		Stem rot	Bacterial blight
Basmati 370	Pure line selection	1	7
Jhona 349	Pure line selection	3	9
IR8	(Peta/DGWG)	9	7
Jaya	(TNI/T141)	9	9
Pusa 2-21	(IR8/TKM6)	1	7
Sona	(GEE 24/TN1)	3	7
Improved Sona	-	1	5
Ratna	(TKM6/IR8)	5	7
Zenith	U.S.A.	9	7
Benibhog	-	7	7
Damodar	-	1	3
CO 13	-	9	3
HAU 1-6-1	(Jaya/Jhona 349)	5	7
HAU 1-38-1-1	(Jaya/Jhona 349)	9	9
HAU 3-103-3	(IRB/Jhona 351)	9	5
HAU 5-162-3	(Palman 579/Basmati 370)	9	7

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