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Screening for resistance of rice entries to bacterial blight in West Bengal

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During kharif (wet) season 2000,149 entries of NSN-1 were evaluated for their response to bacterial leaf blight under artificial inoculated condition at Bankura. Five entries recorded resistant reaction to the disease while fourteen entries manifested moderately resistant reaction.

Key words : Bacterial leaf blight, resistance, rice entries

Bacterial leaf blight of rice (BLB) caused by *Xanthomonas oryzae* pv. *oryzae* Dowson was first reported from Japan in 1908. In India, it was first reported by Srinivasan *et al.* (1959) and subsequently it caused severe damage to rice cultivation in Bihar and other parts of North India (Srivastava and Rao, 1963, 1964 ; Pavgi *et al.*, 1964). This flare up of the disease was mainly due to the introduction of certain high yielding and late maturing varieties. The high tillering capacity of these varieties along with the indiscriminate use of nitrogenous fertilizers provide a micro climate which predisposes the plants to the disease. Cultivators suffered severe losses due to the disease (Srinivasan *et al.*, 1959 ; Reddy and Shukla, 1986 ; Singha *et al.*, 2000) and effective management of the same, became a mandate.

In the absence of specific chemical control, efforts have been directed towards exploitation of resistant genes and this was achieved by systematic resistance breeding programmes (Ou *et al.*, 1971 ; Harichard *et al.* 1985 ; Akhtar and Akram, 1987 ; Goel *et al.*, 1987).

During 2000 kharif (wet) season under the All India Co-ordinated Rice Improvement Programme (AICRIP), 149 rice entries of National Screening Nursery (NSN-1) were screened at RRS, Bankura (representing Red and Laterite Zone) for resistance to bacterial blight disease, under artificial inoculated condition. Each test entry was planted in two 2 m rows spaced in 20 cm × 15 cm and the plot was fertilized with 120 kg N, 50 kg P and 30 kg/ha. Recommended agronomic practices were followed. During active tillering stage, randomly selected ten hills (except the border ones) were inoculated by using a 'clipping' technique (Kaufman *et al.*, 1973). The inoculum was prepared from infected leaf samples of local susceptible variety.

Disease reaction was recorded 15 days after inoculation. Entries were scored according to the Standard Evaluation System (SES) for rice (0-9 scale) of IRRN, 1996.

Two entries each of irrigated, medium duration and irrigated, upland very early duration i.e. IET 16786 and IET 16787 and IET 16000 and IET 16422 respectively along with one entry of semi deep water, late duration i.e. IET 16475 exhibited resistant (R) reaction. Fourteen entries viz,; IET 15554, IET 15588, IET 16077, IET 16434, IET 16439, IET 16440 ; IET 16783 and IET 16797 (irrigated, medium) ; IET 16423 and IET 16814 (upland, irrigated, very early) ; IET 16249, IET 16284 and IET 16555 (irrigated, mid-early) ; and IET 16726 (upland, irrigated, early) were moderately resistant (MR). The rest of the entries were categorized as susceptible (S) ones (Table 1). The Location Severity Index (L.S.I.) was considerably high (7.43). Disease incidence was high in early, upland irrigated entries and late duration entries under rained lowland (shallow and deep water) eco system, where all plants inoculated with the pathogen died ; thus no R and MR were

found among them.

Table 1 : Reaction of NSN-1 entries of different ecosystems and duration to bacterial leaf blight disease under artificial inoculated condition at Bankura, West Bengal during kharif (wet) season, 2000.

Rice ecosystem	Duration (days)	Total entries (nos)	Entries (nos) SES (0-9) scores					
			0	1	3	5	7	9
Rainfed Upland/ irrigated	VE (<90)	18	0	0	2	2	8	6
	E (90-110)	33	0	0	0	1	17	15
Irrigated	ME (115-125)	37	0	0	0	3	18	16
	M (130-140)	42	0	0	2	8	18	14
Rainfed Lowland								
SHW	L (140-160)	04	0	0	0	0	3	1
SDW	L (>150)	09	0	0	1	0	3	5
DW	L (>150)	06	0	0	0	0	1	5
Total		149	0	0	5	14	68	62
L.S.I.		7.43						

a) R = 0-3 ; MR = 5 ; S= 7-9
b) VE = Very Early ; E = Early ; ME = Mid-early ; M = Medium ; L = Late/long
c) SHW = Shallow Water (Upto 30 cm water depth)
d) SDW = Semi-deep Water (30-50 cm water depth)
e) DW = Deep Water (above 50 cm water depth)

The R and MR entries obtained from this screening can be tailored for further breeding programmes.

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