

Genetic Evaluation and Utilization

DISEASE RESISTANCE

Reaction of rice genotypes to stem rot (SR) fungi and bacterial blight (BB) pathogen

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SR caused by three species of *Sclerotium* (*S. oryzae*, *S. hydrophyllum*, and *S. oryzae* var. *irregulare*) and BB caused by *Xanthomonas campestris* pv. *oryzae* (Ishiyama) Dye are the major rice diseases in Haryana. We evaluated 125 early to medium duration rices against SR and BB at HAURRS, during 1984-85 kharif.

Each test entry was planted in two 2-m-long rows, at 20 × 15-cm spacing. Plants were clip-inoculated with BB suspension at 21 d after transplanting (DT) for kresek and at 45 DT for leaf blight, and scored for resistance at 30 and 14 d after inoculation. SR screening was done in the field as well as in the laboratory. In the field, disease incidence was recorded at maturity when disease development was highest and scored by the *Standard evaluation system for rice* (1980).

In the laboratory, cut stem pieces were wound-inoculated with a small piece of agar-cultured *S. oryzae*, *S. hydrophyllum*, and *S. oryzae* var. *irregulare* separately at booting. The

inoculated stems were set upright in a test tube rack in a tray with 2.5 cm of water. They were covered with plastic bags to retain moisture and incubated at 28-30°C. Lesion length was measured 10 d after inoculation. Entries with lesions less than 10 mm long were considered resistant; those with 10-30 mm lesions, moderately resistant; and those with more than 30 mm, susceptible.

In the laboratory screening, the location severity index (LSI) was 5.97% for *S. oryzae*, 3.46 for *S. hydrophyllum*, and 7.63 for *S. oryzae* var. *irregulare*. In field tests, LSI was 5.51 for SR, 5.78 for kresek, and 5.10 for leaf blight.

Of the entries tested, 11 entries showed resistance to the combination of *S. oryzae* and *S. oryzae* var. *irregulare*, 10 to *S. hydrophyllum* and *S. oryzae* var. *irregulare*, 28 to *S. oryzae* and *S. hydrophyllum*, and 9 to the 3 *Sclerotium* spp. (Table 1). Against BB, 13 entries showed resistance to the kresek phase and 76 to the leaf blight phase. Of nine entries showing resistance to the three *Sclerotium* spp., all except BR51-331-4 exhibited resistance to the blight phase. RP2151-175-1 and RP2151-192-1 need special mention as they had a resistance to all the *Sclerotium* spp. in the laboratory and in the field and also to both phases of BB (Table 2). *J*

Table 1. Reaction of rice varieties to SR fungi *Sclerotium oryzae*, *S. hydrophyllum*, and *S. oryzae* var. *irregulare*. HAURRS, Haryana, India, 1984-85.

Resistant to <i>S. oryzae</i> and <i>S. oryzae</i> var. <i>irregulare</i>	
HAU39-4020-3, HAU119-362, BR51-331-4, BR52-90-2, RP2151-166-4-1, RP2151-175-1, RP2151-192-1, RP2151-192-2-5, RP2151-221-4-2-4, RP2151-224-1, and CR318-548-7.	
Resistant to <i>S. hydrophyllum</i> and <i>S. oryzae</i> var. <i>irregulare</i>	
HAU118-104, BR51-331-4, RP2151-166-4-1, RP2151-166-4-4-1, RP2151-175-1, RP2151-192-1, RP2151-192-2-5, RP2151-221-4-2-4, RP2151-224-4, and CR318-548-4-2-4.	
Resistant to <i>S. oryzae</i> and <i>S. hydrophyllum</i>	
HAU47-3888-2, HAU118-77, HAU118-106, HAU118-108, HAU118-109, HAU118-110, HAU118-111, HAU118-141, HAU118-162, HAU118-183, HAU118-184, HAU118-186, HAU118-206, HAU118-222, HAU118-782, HAU119-309, HAU119-800, HAU120-337, IR9784-142-1-3-3, BR51-331-4, CR318-548-7, RP2135-51-1, RP2151-166-4-1, RP2151-166-4-4-1, RP2151-192-1, RP2151-192-2-5, RP2151-2214-24, and RP2151-2244.	
Resistant to 3 <i>Sclerotium</i> spp.	
BR51-331-4, RP2151-1664-1, RP2151-16644-1, RP2151-175-1, RP2151-192-1, RP2151-192-2-5, RP2151-2214-24, RP2151-2244, and CR318-548-7.	

Table 2. Reaction to SR, and kresek and leaf blight phases of BB in field of entries with resistance to 3 *Sclerotium* spp. HAURRS, Haryana, India, 1984-85.

Entry	Parentage	Reaction ^a to		
		Kresek	Leaf blight	Stem rot
BR51-331-4	IR20/IR5-114-3-1	S	S	R
CR318-548-7	IET4141/CR98-7216	MR	R	MR
RP2151-166-4-1	IET4141/CR98-7216	MR	R	R
RP2151-166-4-4-1	IET4141/CR98-7216	MR	R	R
RP2151-175-1	IET4141/CR98-7216	R	R	R
RP2151-192-1	IET4141/CR98-7216	R	R	R
RP2151-192-2-5	IET4141/CR98-7216	S	R	R
RP2151-221-4-2-4	IET4141/CR98-7216	MR	R	R
RP2151-224-4	IET4141/CR98-7216	MR	R	MR

^aR = resistant (score of 3 or lower), MR = moderately resistant (5), and S = susceptible (7-9).

Reaction of rice cultivars to bacterial blight (BB)

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BB is a major rice disease in the Tarai region of Nepal. In 1985 kharif, 117 rice cultivars were evaluated for reaction to BB.

Each entry was transplanted into earthen pots 21 d after sowing. At maximum tillering, plants were clip-inoculated with a BB suspension from