

Disease resistance

Screening of rice varieties and lines against stem rot in Bangladesh

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To isolate and identify sources of resistance to stem rot of rice caused by *Sclerotium oryzae* Catt. (*Leptosphaeria salvinii* [Catt.] Kr & Web), 1,005 varieties and lines collected from the BRR germplasm bank and advanced breeding lines were screened during 1978 boro, aus, and T. aman seasons in BRR fields.

One-month-old seedlings were transplanted at 25- x 20-cm spacing in 2-m single rows. A check variety, Iratom-38 or TN1, was planted after every 10 entries and on both ends of every block. Fertilizer was applied at 90:67.5:45 kg/ha (urea in 2 splits) and the rows were weeded. The levees surrounding the nursery plot were raised and plastered with mud to maintain at least 7-10 cm standing

Summary of results of screening rice varieties and lines against stem rot at BRR, Joydebpur, Dacca, Bangladesh, 1978.

Season	Varieties, lines screened (no.)	Varieties and lines (no.) with disease score ^a of			
		0	0.1-3.0	3.1-6.0	6.1-9.0
Boro	78	0	19 ^b	58	1
Aus	429	0	53 ^c	334	42
T. aman	498	0	9 ^d	428	61

^a0 = immune, 0.1-3.0 = resistant to moderately resistant, 3.1-6.0 = intermediate, 6.1-9.0 = susceptible to highly susceptible.

^bIncludes B5441b-Kn-7-1-2-3, BG375-1(75-404), BR8, Chandrasail 1, Chainung-Sen-yu-6, DJ684D, IR32, IR944-85-1-2-1-1-2-1, IR2071-586-5-6-4, IR2451-90-4-3, IR2793-80-1, and IR3464-75-1-1.

^cIncludes B441bl26-2-3-1-9, B462B-Pn-1-3, Baspati, BR6, BR161-2B-42, BR168-2B-23, BR1031-48-1-2, C168, Chakila, Chandina, Chandrasail 1, Giza, B541b-Kn-19-3-4, IR2071-625-1, BG11-11, BG35-2, BR2-29-2-1-3, BR3-12-B-15-54, BR4-30-3-2-1, BR4-30-51-2, BR9-17-4-1, BR13-47-3, IET5107, IR2061-214-3-3-32, and IR2061-214-3-14.

^dIncludes BR4-30-3-2-1, BR52-87-1/HR90, BR52-87-1/34, IR2031-2384-1-3-2, Purbachi, Remadja, Tan I x Ta-Poo-cho-Z, Badaia chikon, and BR4.

irrigation water. At the late tillering stage plants were inoculated with *S. oryzae*. Sclerotia and mycelia were prepared in an autoclaved 2:1 rice hull: rice grain mixture and spread over the center of the rows at 20 ml/row. Infection on the outer leaf sheath became visible 2 weeks after inoculation.

At maturity 3 to 4 hills from the center of each row were cut down to soil level, and then 25 random tillers were graded individually on a disease index scale of 0-9, based on depth of infection and severity. The average reading from the 25 tillers was considered the index for the variety (see table). ■

Insect resistance

Resistance of paddy varieties to gall midge

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Epidemics of the paddy gall midge *Orseolia oryzae* occurred in 1971, 1972, 1975, 1976, and 1978 in the rice bowl of Chattisgarh, Madhya Pradesh. Early, medium, late, and resistant groups of tall and semidwarf paddy were therefore screened for reaction to gall midge in government farms and cultivators' fields.

In the early group susceptibility to silver shoots ranged from 0.7 to 41%

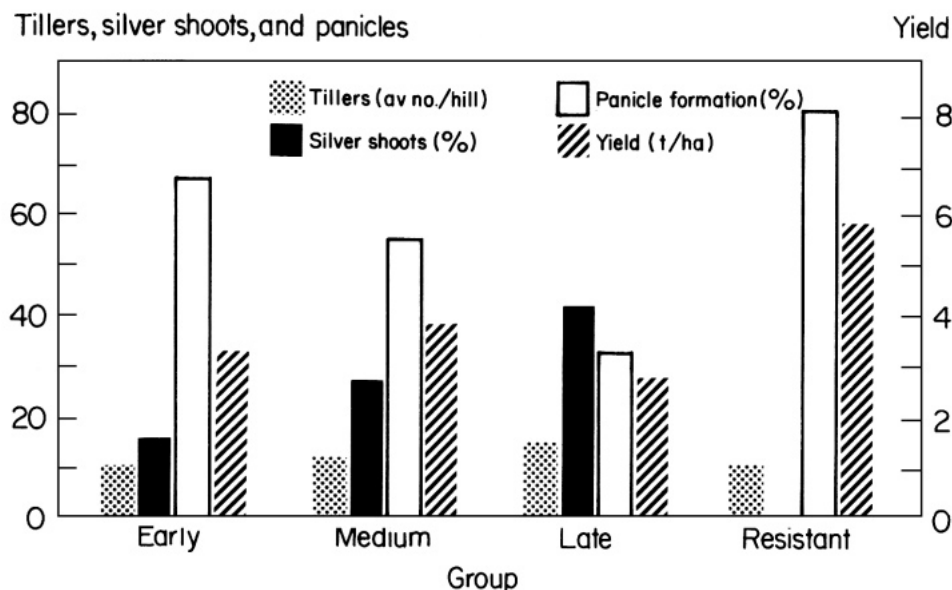
Reaction of transplanted varieties to gall midge *Orseolia oryzae* in 1978 kharif. Raipur, India.

Designation	Tillers (av no./hill)	Panicles (%)	Silver shoots (%)	Yield (t/ha)
<i>Early</i>				
R155-2598	5.1	96.4	0.7	4.2
R155-355	12.2	47.4	40.9	3.6
JR16-15-1-1	7.2	75.6	3.7	2.8
JR16-15-1-1 ^a	29.7	38.9	22.3	1.5
Anjania ^a	4.3	49.6	13.4	2.3
Kaveri	6.8	72.2	14.5	3.7
Anupama	5.8	86.2	9.1	4.5
<i>Medium</i>				
Kranti	9.7	40.1	28.6	3.3
Garima	15.6	36.5	45.6	4.0
Pragati	14.4	44.3	35.0	4.0
Madhuri	14.1	45.7	26.1	2.4
R2270	13.1	59.8	29.2	3.1
Assamchuri	17.8	47.0	20.4	3.9
TN1	8.7	79.5	17.6	4.5
R8-2535	12.4	73.3	6.2	6.1
Ratna	5.6	63.3	31.4	3.1

Designation	Tillers (av no./hill)	Panicles (%)	Silver shoots (%)	Yield (t/ha)
<i>Late</i>				
IET56-56	18.1	40.2	52.8	4.9
Suku Gurmatiya ^a	9.0	26.7	52.8	1.6
Safari 17 ^a	4.3	39.2	31.3	0.9
Mahsuri	23.8	22.3	25.2	3.7
<i>Resistant</i>				
Bangoli 2 (GMR 11)	9.8	94.9	0.1	6.1
Bangoli 3 (GMR 17)	15.8	91.1	0.0	5.0
Bangoli 5 (GMR18)	10.3	87.2	0.6	6.3
RP9-4	10.8	84.9	0.0	6.2
Bangoli 6 (GMR19)	12.0	82.8	0.2	6.3
RPW6-17	10.0	87.0	0.1	5.4
R2384	6.8	71.6	0.0	5.2
R35-2750	8.8	76.1	0.4	6.8
R35-2752	7.4	49.8	0.4	5.6

^aBroadcast.

Tillers, silver shoots, and panicles



Performance of rices of various maturity groups in relation to gall midge.

(see table). Transplanted paddy always yielded more than broadcast paddy.

In the medium maturity group, silver shoots ranged from 6.2 to 45.6%.

Gall midge was severe in both tall and semidwarf varieties of the late maturity group.

Resistant varieties not only withstood the gall midge attacks but also performed well in panicle formation and yield.

The performance of each paddy group was determined. The average percentage of panicles decreased gradually from early to late maturity groups, but was highest in the resistant varieties (see figure). Similarly, the percentage of gall midge infestation, as indicated by silver shoots, was lower in the early group and higher in the medium and late groups. Medium-maturing varieties yielded highest. Resistant varieties performed best.

Large-scale cultivation of resistant varieties can help control gall midge and reduce the use of insecticides, which not only are costly but also perform poorly against gall midge. ■

GENETIC EVALUATION AND UTILIZATION

Drought resistance

C22, a promising rice culture for semidry tracts

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The variety C22 was evolved at the University of the Philippines at Los Baños from the cross Tjere Mas/BPI-76//Palawan/Azucena. It was received through the International Rice Testing

Program, coordinated by IRRI, as one of the entries in the Third International Upland Rice Yield Nursery.

A medium-tall variety with long slender grain, C22 matures in 135 days.

It was tested in yield evaluation trials for 3 consecutive years in samba season (Aug–Dec 1976–78). The popular varieties IR20 and TKM8 were also tested in the trials (see table). ■

Performance of C22 at Tirurkuppam, Tamil Nadu, India.

Variety	Mean yield (t/ha)	Increase over TKM8 (%)	1000-grain wt (g)	Grain shape
C22	3.7	49.1	22.4	Slender
IR20	2.8	12.8	20.5	Medium
TKM8	2.5	—	19.7	Medium