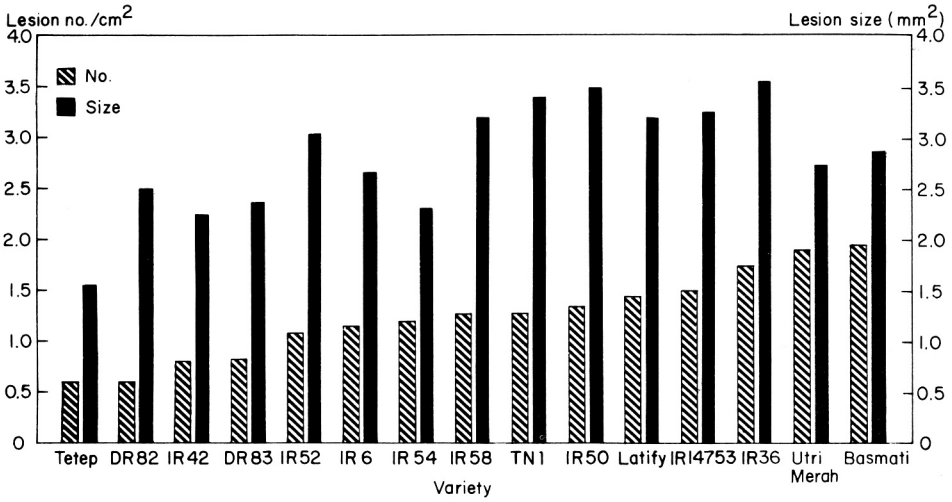
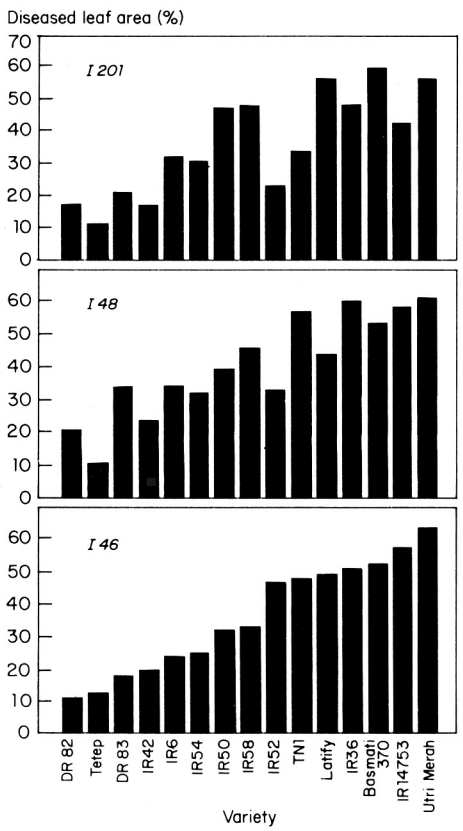


The varieties had from 0.6-2.0 lesions/cm^2 and lesion size varied from 1.6 to 3.6 mm^2 (Fig. 1). Diseased leaf area ranged from 10.2 to 63.6% (Fig. 2). Tetep was resistant to three isolates. DR82 and IR42 produced the same lesion number and almost the same lesion size. IR36 was susceptible. Although there was some isolate-by-variety interaction, it was not sufficiently distinct to constitute evidence of physiological races of the BS fungus.

1. Mean lesion number and mean lesion size on 15 rice varieties inoculated with 3 isolates of *Bipolaris oryzae* at seedling stage. IRRI, 1985.



2. Mean diseased leaf area percentage recorded on 15 rice varieties inoculated with 3 isolates of *Bipolaris oryzae* at seedling stage. IRRI, 1985.

Individuals, organizations, and media are invited to quote or reprint articles or excerpts from articles in the IRRN

Genetic Evaluation and Utilization
INSECT RESISTANCE

Whitebacked planthopper (WBPH) growth and development on rices with monogenic or digenic resistance

H.R. Rapusas and E.A. Heinrichs, Entomology Department, IRRI

Monogenic rice cultivars with genes *Wbph 1, Wbph 2, Wbph 3, Wbph 4,* and *Wbph 5* for resistance to WBPH *Sogatella furcifera* and digenic cultivars with genes *Wbph 1* + *Wbph 2, Wbph 1* + *Wbph 3, Wbph 1* + 1 unidentified recessive gene, and *Wbph 2* + 1 unidentified recessive gene were tested for their effect on WBPH growth and development. Theoretically, rice cultivars with more than one gene for resistance are more resistant than those with only one gene.

Six-day-old seedlings of the test varieties were transplanted in 5-cm-diam clay pots at 1 seedling/ pot. There were 10 replications with 3 pots/replication. The pots were set in standing water on a galvanized iron tray in the greenhouse and arranged in a randomized complete block design.

Two weeks after transplanting, potted plants were placed in mylar film cages. Two newly hatched WBPH nymphs reared on TNl were placed in each cage. As adults emerged, they were counted and the date was recorded. Individual adults were placed in plastic vials and weighed in an electric Mettler balance (1 µg sensitivity). When emergence was complete, percent survival, mean development time, and growth index and weight per adult were computed.

$$\% \text{ survival} = \frac{\text{no. of adults that emerged}}{\text{no. of nymphs used for infesting}} \times 100$$

$$\text{Growth index} = \frac{\% \text{ survival}}{\text{mean development period (d)}}$$

To determine WBPH population growth on the cultivars, 6-d-old seedlings were transplanted in 10-cm-diam clay pots at 5 seedlings/pot. There were 10 replications with one pot as one replication.

Two weeks after transplanting, the plants in each pot were placed in a 10-× 90-cm mylar film cage to exclude other rice pests and natural enemies. Ten days later, the plants were examined, pests and predators were removed, and 5 pair of 3-d-old WBPH adults were placed in

each cage. Twenty-five days later, WBPH population was counted and progeny per female was computed.

Levels of resistance of monogenic cultivars with the five different genes were similar except in the population growth test, in which Podiwi A-8 (*wbph 4*) was least resistant and did not differ from susceptible TN1 (see table). WBPH resistance was not related to the number of genes for resistance.

IR2035-117-3 (*Wbph 1 + Wbph 2*) was the most resistant cultivar. High resistance level was indicated by low WBPH survival, long nymphal period, low growth index, low female weight, and low population growth. NP130, CI 5662-2, and ARC5752 have the same major genes for resistance, but were less resistant and for most growth parameters were equal to monogenic cultivars.

Results show that the levels of resistance of a cultivar cannot be predicted by studies of other cultivars with the same genes for resistance.

Development of WBPH on rice cultivars with different genes for resistance[a], IRRI, 1985.

Variety	Resistance genes	Adu1t survival (%)	Nymphal period (d)	Growth index	Female wt (mg)	Population growth (no. progeny/ female)
N2	2 *Wbph 1*	77 bcd	11.6 abcd	6.57 bcd	1.18 abc	19 ab
ARC10239	*Wbph 2*	63 abc	11.8 bcd	5.40 abc	1.44 cde	54 cd
ADRS	2 *Wbph 3*	67 abcd	11.5 abcd	5.85 bc	1.24 abcd	25 abc
Podiwi A-8	*wbph 4*	72 abcd	11.2 ab	6.41 bcd	1.59 e	89 e
N'Diang Marie	*Wbph 5*	71 bcd	11.1 ab	6.87 bcd	1.51 de	35 abcd
IR2035-117-3	*Wbph 1 + Wbph 2*	50 a	13.4 e	3.81 a	0.99 a	7 a
NP130	*Wbph 1 + Wbph 2*	80 bcd	11.4 abc	7.03 cd	1.38 bcde	28 abc
CI 5662-2	*Wbph 1 + Wbph 2*	17 bcd	11.3 abc	6.76 bcd	1.31 abcd	33 abcd
ARC5752	*Wbph 1 + Wbph 2*	68 abcd	12.0 cd	5.74 bc	1.28 ab	42 bcd
Chaia Anaser	*Wbph 1 + Wbph 3*	77 bcd	11.8 bcd	6.51 bcd	1.42 cde	63 de
Katuyjar Dhan	*Wbph 1 + Wbph 3*	59 ab	11.6 abcd	5.15 ab	1.33 bcde	64 de
Colombo	*Wbph 2* + 1 recessive	82 cd	12.2 d	6.70 bcd	1.09 ab	13 ab
368	*Wbph 1* + 1 recessive	68 abcd	11.8 bcd	5.83 bc	1.90 abcde	35 abcd
WC1240	*Wbph 1* + 1 recessive	65 abcd	11.7 abcd	5.51 bc	1.15 abc	27 abc
65	*Wbph 1* + 1 recessive	75 bcd	11.1 ab	6.76 bcd	1.44 cde	55 cd
274 A	*Wbph 1* + 1 recessive	65 abcd	11.4 abc	5.72 bc	1.25 abcd	39 abcd
TN1	– – –	85 d	11.0 a	7.71 d	2.04 f	88 e

[a] Separation of means in a column by Duncan's multiple range test at the 5% level. Av of 10 replications.

Although the varieties have the same major gene, they have diverse pedigrees and may have different sets of minor genes which greatly influence the resistance levels of these cultivars to the insect.

IET7575: a brown planthopper (BPH)-resistant variety for Karnataka, India

Gubbaiah and B.Vidyachandra, All India Coordinated Rice Improvement Project, Rice Research Station (RRS). V. C. Farm Mandya, Karnataka, India

In 1982 kharif, we screened 47 rices for field reaction to BPH at RRS, Mandya. In 1983 we screened promising entries of the 1982 trials. IET7575 (Sona/ Manoharsali) was resistant to BPH. In 1983 and 1984 kharif, verification trials were conducted in large plots with BPH-susceptible TN1 grown next to IET7575. TNI was hopperburned, but there were only 2-3 BPH/hill on IET7575.

IET7575 matures in 135 to 140 d. It has moderate tillering; broad, green leaves; late senescence; long slender grains without white belly; 2-wk seed dormancy; and good grain quality. With 100 kg N/ha, it yielded an average 6.8 t/ha. Trials conducted in farmer fields in BPH endemic areas confirmed its resistance to BPH. It also yielded more than popular high yielding varieties.

In summer and kharif 1984, IET7575 performed well in large BPH-prone areas in Channapatna (Bangalore District) and Maddur Talus (Mandya District). The State Department of Agriculture plans large-scale demonstrations to popularize the variety in Karnataka.

Virulence of *Nephotettix virescens* colonies on resistant rices

H.K. Rapusas and E.A. Heinrich. Entomology Department, IRRI

Colonies selected for virulence on rices with genes for resistance to *N.virescens* were compared with a colony reared on susceptible TN1 for 100 generations. Their virulence to ASD7, ASD8, and the varieties on which they were reared was studied to determine whether *N. virescens* populations can adapt to previously resistant varieties in the greenhouse.

Resistant varieties on which the insect colonies were reared were Pankhari 203 (*Glh 1* gene for resistance), IR8 (*Glh* 3). Ptb 8 (*glh 4*), TAPL, 796 (*Glh 6*), and Moddai Karuppan (*Glh 7*). The colonies were tested for virulence to Pankhari 203, ASD7 (*Glh 2*), IR8, Ptb 8, ASD8 (*Glh 5*), TAPL 796, and Moddai Karuppan. Virulence was determined by plant damage.

Twenty seeds/row per variety were sown in three replications. Seedlings were thinned to 151 row 6 d after seeding (DAS). At 7 DAS they were infested with three 2d- and 3d-instar nymphs/seedling from the respective colonies. Plant damage was recorded for 7 d beginning 5 d after insect infestation, using the Standard evaluation system for rice. Damage was calculated as the mean of seven ratings.

Colonies were most virulent to the varieties on which they were reared (see figure). Some colonies had cross virulence — IR8 on Pankhari 203. Pankhari 203 on IR8, and Ptb 8 on