

(decamethrin) at 8 g active ingredient/ha as a foliar application using a knapsack sprayer; the other part was untreated.

Weekly for 6 wk, 10 hills from each plot were randomly sampled for BPH and spiders using a D-Vac suction sampler. Insects and spiders were identified, counted, and their numbers plotted to show population trends. Rice yields were taken from each plot.

The BPH population in the sprayed plot resurged to about 500 insects/20

hills; that in the unsprayed plot remained below 100/20 hills (see figure). In contrast, the number of spiders remained low in sprayed plots but reached a peak of more than 550/20 samples in the unsprayed fields.

Rice grain yields were significantly lower in the treated plot (137 kg) than in the untreated one (159 kg). The larger BPH number clearly reduced yields in the sprayed plot, thus negating the possible expression of insect resistance in IK62.

Any effects of a resistant rice variety may be masked by unnecessary insecticide sprays that induce BPH populations. Early insecticide spraying kills spiders and causes BPH numbers to multiply unchecked. This increase of BPH puts the varietal resistance of IR62 at risk because it induces local BPH populations to more quickly adapt to resistant varieties than they would without the chemical treatment. □

Genetic sources of resistance to whitebacked planthopper in scented quality rices

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Aromatic (Basmati) rices command a premium price in international markets. They have superfine grains, pleasant aroma, and kernel elongation with soft texture upon cooking. All of the traditional Basmati types are tall, susceptible to many insects and diseases, and low yielding. It has been difficult to transfer the key quality characteristics of Basmati rices into productive dwarfs that have pest and disease resistance.

We screened 400 scented quality rices to identify Basmati types with resistance to whitebacked planthopper (WBPH) *Sogatella furcifera* (Horvath), a major pest in Basmati-growing areas in India, brown planthopper (BPH) *Nilaparvata lugens* (Stål), and gall midge (GM) *Orseolia oryzae* (Wood Mason) under artificial infestations in a glasshouse. Some important quality traits, such as aroma, kernel length (KL), length-to-breadth ratio, anti kernel length after cooking (KLAC), were also studied.

None of the Basmati types were resistant to either BPH or GM, but some showed varied reaction to WBPH. HBC5 was the only variety found resistant to WBPH (see table). HBC5 has extra-long slender grains, KL of 7.42 mm, strong scent, and a high KLAC of 13 mm. Basmati Kota, with moderate resistance

Key quality attributes of scented quality rices and reaction to WHPH. DKR, Hyderabad, India, 1990 wet season.

Variety	Nature of resistance ^a	Score ^b	Kernel length ^b (mm)	Length: breadth	Kernel length after cooling (mm)	Grain type	Aroma ^d
HBC5	R	2.7	7.42	4.21	13.0	LS	SS
Dehradun Basmati	MR	5.1	6.07	3.13	10.0	LS	SS
Basmati 397	MU	4.4	6.67	3.83	13.7	LS	SS
Basmati 405	MR	3.6	6.79	3.53	10.8	LS	SS
HBC85	MU	3.2	7.65	3.98	12.2	LS	SS
HBC98	MU	3.6	6.63	3.83	13.7	LS	SS
Basmati Kota	MU	3.5	7.54	3.95	15.0	LS	SS
Lua Nheden	MR	4.4	5.74	2.94	8.5	LB	MS
Basmati 370	S	9.0	6.63	3.45	12.5	LS	SS
Mean			6.19	3.65	12.16		
CV (%)			11.9	18.3	20.0		

^a R = resistant, MR = moderately resistant, S = susceptible. ^b Scored by the Standard evaluation system for rice scale of 0-9, 1988. ^c LS = long slender, LB = long bold. ^d MS = mild scent, SS = strong scent.

to WBPH, has extra-long grains and showed the highest KLAC of 15.0 mm. Basmati 397 and HBC98 also had moderate WBPH resistance and good

KLAC. These varieties can be readily utilized in breeding programs to develop high-yielding dwarf Basmati rices. □

Screening Basmati rices for stem borer resistance

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We evaluated Basmati rices comprising 19 scented dwarf, 6 scented tall, and 10 new entries or lines for resistance to stem borer *Scirpophaga incertulas* (Lepidoptera: Pyralidae) in the field during 1990. Each entry was planted in 20-m² plots at 20- × 15-cm spacing with three replications. Total and affected panicles from 10 random hills in each plot were counted at flowering stage to calculate damage.

Infestation (whiteheads) ranged from 6.3 to 51 % in the scented dwarfs (see

Resistance of Basmati entries to stem borer.

Entry, culture	Whiteheads(%)
<i>Scented dwarf</i>	
HKR86 411	51.0
BBC19 (check)	48.8
Bas 370 (check)	48.5
HKR403	47.0
HKR239	46.5
HKR86-40	45.9
HKR240	45.5
HKR242	38.9
HKR416	37.7
HKR86-404	37.7
HKR401	32.8
IET120-11	31.3
HKR236	29.3
HKR410	27.8
HKR238	18.0
Pusa Basmati 1	16.2
HKR228	10.9
Kasturi	8.1
HKR243	6.3

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