

Karnataka because of their wide distribution during kharif.

Each test variety was surrounded by highly susceptible varieties HR-12 for BL, Binnibhog for BS, and PTB20 for UDb to expose them to natural infection. Observations were recorded using the Standard Evaluation System for Rice. BL and BS were rated by lesion type and percent leaf area affected. Blast incidence after flowering was recorded as percent neck infection, and number of discolored grains per panicle was recorded for GD assessment. Percent infected panicles was recorded for UDb.

KMS7, KMS9, KMS5914, KMP10, KMP39, KMP41, and Jaya had resistant reactions to the four diseases (see table). □

TABLE CONTINUED

Variety	Disease score <sup>a</sup>				
	BL		BS	GD	UDb
	Leaf	Neck			
29509	R	M	M	M	S
KMP101	R	R	M	R	R
Pusa 150	R	R	R	R	M
KMP10	R	R	R	R	R
29781	M	M	R	R	M
HP-1-1	R	R	R	M	M
KMP41	R	R	R	R	R
KMS5914	R	R	R	R	R
KMP39	R	R	R	R	R
ES-18	M	M	M	R	S
Jaya	R	R	R	R	R
IR20	R	R	M	R	R
Rasi	R	M	M	R	M
Mangala	R	R	M	R	M
IR32	M	R	M	R	R

<sup>a</sup> R = resistant (0-3 of the 1980 SES scale), M = moderately susceptible (4-6) and, S = susceptible (7-9).

GENETIC EVALUATION AND UTILIZATION

Insect resistance

Evaluation of promising gall midge-resistant cultivars

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Rice gall midge *Orseolia oryzae* (Wood Mason) Mani is a major pest of rice in kharif in many Indian rice growing states. Thirty-eight promising gall midge resistant cultivars developed by breeders were received through the All-India Coordina-

ted Rice Improvement Project, Hyderabad, during 1979 kharif for testing at the Central Rice Research Institute, Orissa. The experiment was laid out in a randomized block design with two replications. Seedlings were spaced at 20 × 15 cm and the plot was fertilized with 60 kg N, 22 kg P, and 25 kg K/ha. Silvershoots were counted at 30 and 50 days after transplanting and average incidence was calculated.

The maximum 32.6% silvershoots was recorded for WGL 26888

(IR22/W12708). Eight cultivars had less than 3% silvershoots, which was significant at the 1% level. They were OR140-9-3 (CR94/RPW6-13), OR158-7-1 (GMR15 18/Pankaj), WGL 26450, WGL 26528, WGL 26536, WGL 26591, WGL 26965, and WGL 27015 (Surekha/Kakatiya). Of these, OR140-9-3, OR158-7-1, and WGL 26450 also had less than 2% silvershoots at Raipur, Rudrur, Bhubaneswar, Mangalore, and Warangal. □

GENETIC EVALUATION AND UTILIZATION

Drought tolerance

Screening wetland rice varieties for drought tolerance

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Drought tolerance at vegetative stage is desirable for deepwater rice. Forty varieties (10 recommended, 11 traditional, and 16 improved) including 2 drought-resistant and 1 susceptible check were

Comparative performance<sup>a</sup> of some wetland rice varieties under drought stress.

Entry	Initial stand establishment, 21 DS	Drought tolerance, 45 DS	Recovery, 81 DS	Height (cm), 133 DS	Phenotypic acceptability 133 DS
<i>Recommended varieties</i>					
Pankaj	8.3	9	7.6	31.1	8.3
Mahsuri	7.3	9	8.3	49.3	8.3
Swarna (IET 5656)	9	9	9	22.6	8.3
CR 1009	7.6	9	7.6	49.2	7.6
CR1014	7	9	7.6	61.1	7.6
BIET 821	3.6	3.6	5	88	5
<i>Traditional indica</i>					
OC1393	6.3	7.6	6.3	71.3	7
NC487/77	1.6	1	1.6	93.6	1

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tested to determine drought tolerance.

Seeds of each variety were drilled in rainfed fields on 31 Mar 1983 in 5-m-long rows in 3 replications. Stand establishment, drought damage, drought recovery ability, and phenotypic acceptability were recorded 21, 45, 81, and 133 days after seeding (DS). From 21 to 45 DS the plot received 7 mm precipitation. Maximum air and soil temperature ranged from 31.6 to 41.3°C and 34.7 to 48.3°C.

Twenty entries had a drought score of 9 at 45 DS. Eleven entries, including the susceptible check, died during the vegetative period. Pureline selection NC487/77 and hybrid lines CN506-147-2-1 and CN506-147-14-2 (IR30/LMN111//IR1514A-E660) performed better than the resistant check. Jalaplaban, Jaladhi 2, Jaladhi 3, and Janki, all pureline selections, had a high level of drought tolerance (see table). □

TABLE CONTINUED

Entry	Initial stand establishment, 21 DS	Drought tolerance, 45 DS	Recovery, 81 DS	Height (cm), 133 DS	Phenotypic acceptability 133 DS
NC488/78	3.6	6.3	5	71.4	4.3
Achra 108/1	3.6	5	3.6	77.5	3.6
Jalaplaban	2.3	2.3	3	77.8	2.6
FR13A	5.6	7	6.3	63.8	6.3
Jaladhi 1	6.3	6.3	5	75.9	5.6
Jaladhi 2	4.3	3.6	3	83.2	3
Jaladhi 3	3	1.6	3	95.8	2.6
Janki (C64-117)	3	1.6	3	87.5	2.6
Tilokkachari	6.3	6.3	7	74.5	6.3
<i>New varieties</i>					
CN506-147-2-1	3	3	2.3	83.3	2.3
CN506-147-14-2	3	5	3	52.8	2.3
CN683-1	5.6	5	5	80.5	3.6
FPAR 7809	5.6	5	4.3	50.1	5
<i>Resistant check</i>					
Dular	5	3.6	3	102.5	2.6
Salumpikit	8.3	9	8.3	58.7	8.3
<i>Susceptible check</i>					
IR20	9	9	9	28.5	9
Rainfall (mm)	105.9	7.0	116.1		210.5

<sup>a</sup>1980 Standard Evaluation System for Rice. Three replications. DS = days after sowing.

## GENETIC EVALUATION AND UTILIZATION

# Deep water

### Plant height and growth duration at increased water depths

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Popular semidwarfs were compared with tall varieties in duration and plant height at 55 and 74 cm water depths. Thirty-

day-old seedlings were transplanted during the last week of June. Nitrogen was applied in 2 equal splits to supply 40 kg N/ha during tillering stage. Plots were flooded 45 days after planting and water level was maintained for 3 months, until the first week of November.

Semidwarfs generally showed greater increase in plant height (28-36 cm) than

intermediate and tall (18-34 cm) varieties. MTUI6, the traditional deepwater variety, increased 16 cm at 55-cm depth, and 40 cm at 75-cm depth. Flowering duration was delayed by 4-13 days for semidwarfs and 0-8 days for intermediate and tall varieties. Semidwarf varieties had weak stems and lodged at the 75-cm water depth. □

## GENETIC EVALUATION AND UTILIZATION

# Temperature tolerance

### Himalaya 1 and Himalaya 2 — two new semidwarf, cold-tolerant rices for Himachal Pradesh, India

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Fifty percent of the rice area of Himachal Pradesh is at altitudes higher than 900 m.

Cold temperatures during flowering reduce rice yields.

Himalaya 1 and Himalaya 2, semidwarf indicas released in 1982, can be successfully cultivated up to 1,550 m altitudes. Himalaya 1, the experimental line HPU734, is a very early maturing selection from IR579 (IR8/Tadukan). It is recommended for low, mid, and high hills. Himalaya 2, the experimental line

HPU71, is an early maturing selection from Pusa 33 (Improved sabarmati/Ratna). It is recommended for low and mid hills up to 1,300 m.

Himalaya 1 is high yielding, cold tolerant, and blast resistant. It yields an average 3.9 t/ha — 26, 15, and 3% more than IR579, China 988, or Himdhan (Table 1). It has long, slender, translucent grains with good cooking quality.