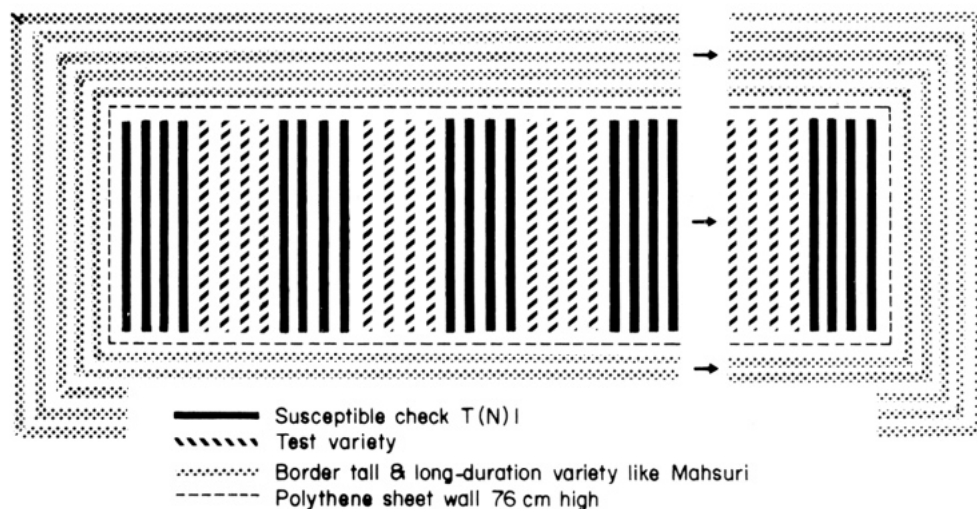


ble check (see figure). Beginning 10 days after transplanting (DT), the entire area is sprayed every 10 days with 0.02% methyl parathion or every 15 days with 0.005% decamethrin. Before 30 DT, test varieties are enclosed in a 76-cm-high polythene sheet wall with the top open. Beginning 30 DT, nymphs and adult BPH are released regularly within the enclosure until a sufficient population is reached.

Planting the alternate check in 4 rows, erecting the surrounding polythene sheet wall, and the initial infestation are the improvements over earlier methods. These additions ensure early pest establishment in the screening area, prevent insect movement outside the area, and ensure a high insect buildup.

In screening during 1981 rabi, the BPH population built rapidly from 70 DT and peaked 77 DT. By 83 D,

alternating susceptible varieties and some test entries had hopperburn. Insect population was recorded every week; plant damage was recorded when all TN1 plants were killed. With this method, several HPH-resistant cultures identified in the greenhouse were successfully field evaluated in three consecutive seasons. The method is being tested in 1981 kharif at Maruteru and Pantnagar. ■



An improved method for field screening rice against brown planthopper at Hyderabad, India.

## GENETIC EVALUATION AND UTILIZATION

# Temperature tolerance

### Effects of temperature on rooting ability of rice seedlings

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When temperature is low during early spring transplanting in the Shanghai area, poor rooting ability causes poor recovery of rice seedlings. A test of rooting ability of rice seedlings under five temperature conditions was conducted at Shanghai March-April 1981.

Four *indica* rice varieties, Er Jiu-qing, Yuan Feng-Zao, 776, and Guang Lu-Ai No. 4, were raised in individual nurseries in the greenhouse. One hundred plants per variety were sampled at 32 days seedling age. Their roots were clipped

off and cultured in glass bottles filled with water. Ten plants per treatment, with two replications per variety, were cultured at 20, 25, 30, 35, and 40 ( $\pm 0.5$ )° C temperatures. After 5 days, root number, root dry weight, and root

length were measured (see table).

There was a curvilinear relationship between root number (N) and temperature level (T) for all four test varieties (see figure). The optimum temperature for maximum root number was esti-

Rooting ability of rice seedlings under different temperatures<sup>a</sup> at Shanghai.

Parameter	Variety	20° C	25° C	30° C	35° C	40° C
Root number per plant	Er Jiu-Qing	1.20	1.90	2.85	2.70	0.70
	Yuan Feng-Zao	1.00	2.00	2.05	1.65	0.95
	776	1.65	2.80	2.95	2.80	0.40
	Guang Lu-Ai No. 4	1.55	2.75	2.60	1.50	0.35
Root length (cm) per plant	Er Jiu-Qing	0.65	1.08	1.99	1.75	0.16
	Yuan Feng-Zao	0.31	0.59	0.89	0.71	0.18
	776	0.64	1.59	1.90	1.72	0.07
	Guang Lu-Ai No. 4	0.56	1.33	0.95	0.33	0.06
Root dry weight (mg/plant)	Er Jiu-Qing	0.06	0.12	0.19	0.16	0.04
	Yuan Feng-Zao	0.04	0.09	0.13	0.08	0.04
	776	0.07	0.15	0.23	0.18	0.02
	Guang Lu-Ai No. 4	0.06	0.16	0.09	0.05	0.03

<sup>a</sup> Mean of 2 replications.

mated by

$$T_{opt} = -\frac{b}{2c}$$

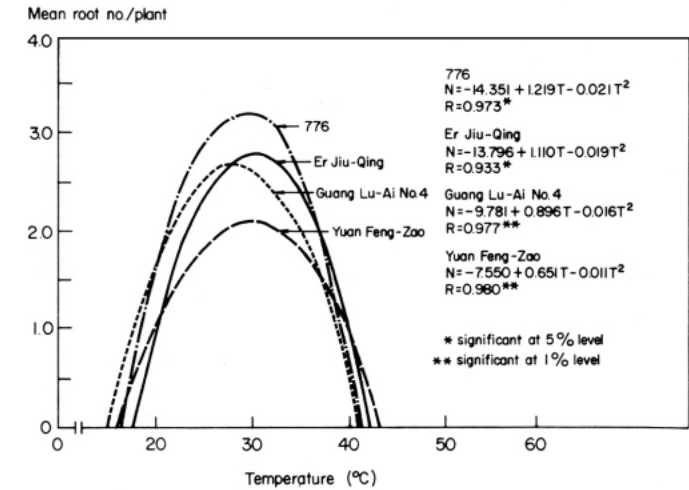
The starting temperature was calculated by

$$T_{start} = T_{opt} - \frac{\sqrt{b^2 - 4ac}}{2c}$$

The coefficients of correlation (r) between root number and temperature level were 0.980\*\* for Yuan Feng-Zao, 0.977\*\* for Guang Lu-Ai No. 4, 0.933\* for Er Jiu-Qing, and 0.973\* for 776. The optimum temperatures for root number were 29.6° C for Yuan Feng-Zao, 27.7° C for Guang Lu-ai No. 4, 29.9° C for Er Jiu Qing, and 28.8° C for 776.

The T<sub>opt</sub> for Guang Lu-Ai No. 4, is the lowest for all four varieties, which may indicate its relatively stronger resistance to low temperature. The result also indicates that each rice variety has an optimal temperature level that enhances seedling root number. A lower or higher temperature than this optimum reduces root number.

Root dry weights showed similar trends. The T<sub>opt</sub> for root dry weight of 4 varieties were 29.9° C for Er Jiu-Qing.



Root number of rice seedlings and temperature at Shanghai.

29.7° C for Yuan Feng-Zao, 29.6° C for 776, and 27.5° C for Guang Lu-ai No. 4. The relationship between root length and temperature was quadratic, the coefficients of correlation (r) between root dry weight and temperature were 0.978 for 776, 0.960 for Yuan Feng-Zao, and 0.902 for Er Jiu-Qing. The correlation coefficient for Guang Lu-Ai No. 4 was not significant.

The minimum temperature for root number and root dry weight were

17.7° C and 17.9° C (mean 17.1° C) for Er Jiu-Qing, 15.8° C and 18.3° C (mean 17.1° C) for Yuan Feng-Zao, 16.5° C and 19.0° C (mean 17.8° C) for 776, and 14.9° C and 13.4° C (mean 14.2° C) for Guang Lu-Ai No. 4.

The mean daily optimum temperature during transplanting in the Shanghai area should be above 15° C for Guang Lu-ai No. 4, above 17° C for Yuan Feng-Zao, and above 18° C for Er Jiu-Qing and 776. ■

Effect of sowing date on sterility and vegetation period in western Turkey

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To assess the extent of cool temperature injury during anthesis, with special emphasis on sterility, varieties Kashmir Basmati, Krasnodorsky, Calrose,

Gritna, and Sarikilcik were sown in single rows of 50 plants each on 8 dates at 10-day intervals from 2 April to 11 June 1979. Plant spacing was 10 × 10 cm in 3 replications. Grains and sterile florets were counted separately. The longest average vegetative period was 118 days (first sowing) and the shortest was 84 days (last sowing). Sarikilcik showed the shortest vegetative period and Calrose the longest (see table).

Average floret sterility was lowest in the second sowing date crop and highest in the last. Among varieties, Basmati showed the lowest sterility in its fourth sowing date and Krasnodorsky the highest in its seventh sowing date. A significant sowing date-variety interaction on sterility is shown in the table. Temperature drastically affected sterility. Correlations between sterility and lowest temperature prevailing on the day

Effect of sowing date on days to heading (DH) and sterility of rice in western Turkey.

Sowing date <sup>a</sup>	Sarikilcik		Krasnodorsky		Calrose		Gritna		Kashmir Basmati		Average	
	DH	Sterility (%)1	DH	Sterility (%)	DH	Sterility (%)	DH	Sterility (%)	DH	Sterility (%)	DH	Sterility (%)
1	107	20	107	18	142	23	121	25	112	16	118	20
2	103	14	103	15	130	14	115	17	111	16	112	15
3	94	15	104	17	122	22	108	19	102	14	106	17
4	86	28	94	18	114	11	105	40	119	10	104	22
5	84	21	82	31	110	13	99	19	111	17	97	20
6	82	32	80	39	101	11	96	37	102	18	92	27
7	82	29	75	55	94	13	90	22	94	16	87	27
8	77	35	76	41	89	22	80	36	93	19	84	31
Av	89	24	90	29	113	16	103	27	106	16	100	22.4

LSD: (for sterility % in arcsin transformation) for cultivar: (P: 0.05) = 1.55 for time: (P 0.05) = 1.90.

<sup>a</sup>2 Apr-11 Jun 1979 at 10-day intervals.