

## VARIETAL SCREENING OF RICE FOR RESISTANCE TO STEMBORER, *Scirpophaga incertulas* (Walker)

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Among the seventeen entries screened in two places for their resistance to stem-borer during 1984—85, DPI 1091/1-3, IR 50, Paiyur 1, Sornavazhai, TKM 9 and W 1263 were found to be moderately resistant to stemborer deadhearts (DH) upto 30 DAT and Co 18 upto 50 DAT, while Co 18, Co 21, IR 50, Paiyur 1, SB 13, SB 19 were moderately resistant to white ear (WE) damage, recording a grade of 3 as against grade 9 on Jaya. In the on-farm trial, Paiyur 1 recorded 5.6% deadhearts and 6.6% white-ears as against 12.3% DH and 18.3% WE on Jaya recording a yield of 4995 kg/ha as against 4070 kg/ha on Jaya under unprotected condition.

The varietal screening of rice for their resistance / susceptibility to stem-borer *Scirpophaga incertulas* was done by Israel (1967), Ferando (1967), Shastry *et. al.* (1971), Khush (1977), Prakasa Rao (1983) and Chandramohan (1983) and reported moderately resistant entries. With a view to find out resistant / moderately resistant entries to stemborer, experiments were conducted and the results are presented in this paper.

### MATERIALS AND METHODS

Two field experiments were conducted in a randomised block design, replicated thrice during 1984 with seventeen entries one at Regional Research Station, Paiyur and the other in ryot's field under unprotected condition. During 1985, one on-farm trial was conducted in a non-replic-

ated manner with a plot size of 40 m<sup>2</sup> to screen for their resistance / susceptibility to stemborer under unprotected condition. Entries were planted with a spacing of 20 x 10 cm. Each entry was transplanted in 4 rows of each 4 m length, leaving a spacing of 40 cm between entries and 50 cm between replications. Susceptible check, Jaya was transplanted @ one row in between each entry per replication, 3 rows in between replications and 5 rows all around the plots to serve as bombardment rows.

Observations were made on the incidence of stemborer deadhearts (DH) on 30 and 50 DAT by counting the total and affected tillers on 10 hills selected at random in each entry and the percentage of deadhearts was worked out. Similarly

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Table 1. Data on the incidence of deadheart (DH) and white-earé (WE) to stemborer on rice varieties, Regional Research Station, Paiyur, Tamil Nadu.

S. No. Entry		Mean incidence of stemborer (DH %)				(W. E.%)		Yield in kg/ha (computed)
		30 DAT*		60 DAT*		Actual	Grade	
1	2	3	4	5	6	7	8	9
1.	Co 18	5.4 (40.29)	5	5.4 (26.47)	3	1.9 (20.65)	3	3656
2.	Co 21	5.8 (43.28)	5	7.2 (35.29)	3	2.3 (25.00)	3	3906
3.	Co 43	4.3 (32.46)	3	9.0 (44.12)	5	2.4 (26.09)	5	3688
4.	Co 44	4.8 (35.82)	3	9.8 (48.03)	5	2.5 (27.72)	5	3750
5.	DPI 1091/2	5.4 (49.29)	5	9.1 (44.61)	5	2.4 (26.09)	5	4113
6.	DPI 1091/1-3	4.7 (35.07)	3	8.1 (39.71)	3	1.8 (19.57)	3	4219
7.	DPI 1091/5	3.7 (27.61)	3	9.3 (45.59)	5	2.3 (25.00)	3	4156
8.	IR 50	5.0 (37.31)	3	9.5 (46.57)	5	2.2 (23.91)	3	4000
9.	Jaye	13.4 (100.00)	9	20.4 (100.00)	9	9.2 (100.00)	9	3281
10.	Paiyur 1	5.2 (28.8)	3	8.4 (41.18)	5	2.0 (21.74)	3	3969
11.	SB 13	4.85 (36.20)	3	8.8 (43.14)	5	1.9 (20.65)	3	3875
12.	SB 19	4.9 (36.60)	3	9.1 (44.60)	5	2.0 (21.74)	3	3510
13.	Sattari	4.1 (30.59)	3	4.4 (21.57)	3	3.0 (32.61)	5	844
14.	Sornavazhai	3.1 (23.13)	3	4.1 (20.00)	1	2.0 (27.17)	5	3781
15.	TKM 6	4.0 (29.85)	3	6.7 (32.84)	3	2.5 (30.43)	5	3844
16.	TKM 9	5.0 (37.00)	3	8.4 (41.18)	5	2.3 (25.54)	5	4125
17.	W-1263	4.8 (35.82)	3	6.2 (30.39)	3	2.2 (23.91)	3	3594
SE								288
CD (P=0.05)								839

\* Figures in parentheses are after conversion.

Table 2. Data on incidence of DH and WE due to stemborer and yield at Pothapuram  
Mean incidence of Stemborer

S. No.	Entry	DH %				WE %		Yield in kg/ha [computed]
		30 DAT*		50 DAT*		Actual	Grade	
1	2	Actual	Grade	Actual	Grade	Actual	Grade	9
1.	Co 18	13.0 [49.24]	5	9.0 [36.59]	3	1.9 [18.81]	3	3750
2.	Co 21	9.2 [34.85]	3	12.25 [50.81]	5	2.5 [24.75]	3	3906
3.	Co 43	11.9 [45.07]	5	11.12 [45.52]	5	2.4 [23.76]	3	3656
4.	Co 44	11.8 [44.70]	5	9.0 [36.59]	3	2.3 [22.77]	3	3281
5.	DPI 1091/2	12.2 [46.21]	5	11.8 [47.97]	5	2.9 [26.71]	5	4312
6.	DPI 1091/1-3	9.5 [36.36]	3	10.5 [42.68]	5	2.9 [28.71]	5	4219
7.	DPI 1091/5	12.6 [47.72]	5	12.8 [52.03]	5	2.7 [26.73]	5	4156
8.	IR 50	10.3 [39.02]	3	11.7 [47.56]	5	2.2 [21.78]	3	4000
9.	Jaya	26.4 [100.00]	9	24.6 [100.00]	9	10.1 [100.00]	9	3281
10.	Paiyur 1	10.2 [38.64]	3	9.8 [39.83]	3	2.0 [19.80]	3	3500
11.	SB 13	10.8 [40.90]	5	11.5 [46.84]	5	2.0 [19.80]	3	3875
12.	SB 18	14.42 [53.79]	5	7.3 [29.67]	3	1.9 [18.81]	3	3125
13.	Sertari	11.4 [43.18]	5	12.9 [52.43]	5	1.8 [17.82]	3	844
14.	Sornavazhai	6.9 [26.14]	3	10.2 [41.46]	5	2.0 [19.80]	3	3813
15.	TKM 6	13.1 [49.62]	5	11.6 [47.15]	5	3.6 [35.64]	5	3894
16.	TKM 9	9.1 [34.47]	3	10.7 [43.49]	5	2.4 [23.76]	3	3656
17.	W 1263	9.5 [35.98]	3	20.1 [81.70]	7	2.2 [21.78]	3	3594
	SE							239
	CD (P=0.05)							690

\* Figures in parentheses are after conversion.

Table 3. Data on DH and WE due to stemborer damage and yield.

S. No.	Entry	Stemborer damage			Yield in kg per		
		30 DAT	50 DAT	Mean	Whiteears [%]	Plot [40 m <sup>2</sup> ]	ha
1.	DPI 1091/1-3	6.3 (14.54)	5.4 (13.44)	5.8** (13.99)	7.5 (15.89)	17.10	4275*
2.	DPI 1901/2	5.7 (13.81)	5.0 (12.82)	5.3** (13.36)	6.2** (14.42)	16.28	4070
3.	DPI 1091/5	6.3 (14.45)	7.6 (16.00)	6.9 (15.27)	7.5 (15.89)	18.48**	4620*
4.	Paiyur 1	5.7 (13.81)	5.5 (13.56)	5.6* (13.68)	6.6** (14.89)	19.98	4995*
5.	SB 13	6.4 (14.65)	8.5 (16.95)	7.4 (15.80)	8.0 (16.43)*	13.56	3388
6.	SB 19	4.3 (11.97)	4.7 (12.52)	4.5 (12.24)**	8.5 (16.95)	18.72	4180
7.	Swarnavazhai	6.7 (15.00)	8.0 (16.43)	7.3 (15.71)	13.3 (21.39)	14.96	3740
8.	TKM 6	6.4 (14.65)	7.7 (16.11)	7.0 (15.38)	12.9 (21.05)	15.40	3850
9.	Jaya	10.3 (18.72)	14.3 (22.22)	12.3 (20.47)	18.3 (25.33)	16.38	4070
	Mean	6.4 (14.65)	7.2 (15.56)	6.8 (15.12)	9.6 (18.05)		4132
	Significance :						
	SE			0.46	1.32	0.63	158
	Mean			15.12	18.05	16.52	4132
	* Mean + 1 SE			14.66	16.73	17.15	4290
	** Mean + 2 SE			14.20	15.41	17.78	4448

(Figures in parentheses are arcsin transformed values)

white-ear (WE) percentage was observed in the above lines one week prior to harvest. The data were rated in the scale of 1 to 9 as per the method adopted at IRRI (IRRI, 1980) and the results are presented in Tables 1 and 2. The data on stemborer deadhearts and white ears percentage obtained from on-farm trials were analysed statistically after transforming them into arcsin values and presented in Table 3. Yield data were gathered

after harvest and presented in Tables 1, 2 and 3

## RESULTS AND DISCUSSION

The mean infestation of deadhearts and whiteears revealed that the entries DPI 1091 / 1-3, IR 50, Paiyur 1, Sornavazhai, TKM 9 and W 1263 were moderately resistant to stemborer DH upto 30 DAT and Co 18 upto 50 DAT, recording a mean grade of 3 as against grade 9 on

Jaya. The entries Co 18, Co 21, IR 50, Paiyur 1, SB 13, SB 19 and W 1263 recorded a grade of 3 in infestation of whiteears indicating their moderate resistance to whiteear damage by stemborer. (Tables 1 and 2). Moderate resistance of W 1263 to stemborer deadhearts was reported by Khush (1978) and to stemborer deadhearts as well as whiteears by Prakasa Rao (1983). Prakasa Rao (1983) observed that though W 1263 was more preferred for oviposition, the incidence of DH, WE as well as larval recovery was less on it, due to the fact that just hatched larvae failed to bore and establish inside tillers. Chandramohan (1983) confirmed that accession W 1263 was resistant to stemborer at vegetative and reproductive stages. Co 18 was moderately resistant at both stages and sornavazhai exhibited tolerance mechanism, inspite of supporting higher borer population but recorded higher grain yield per plant. The moderate resistance exhibited by Sornavazhai to deadhearts; Co 18 to whiteears, W 1263 to DH and WE are in conformity with the findings of Chandramohan (1983) and Prakasa Rao (1983). With regard to yield, entries DPI 1091/2, DPI 1091/1-3 and DPI 1091/5 recorded 4313, 4219 and 4156 kg/ha respectively but were on par with other entries except Sattari (Tables 1 and 2).

The results of on-farm trial showed that paiyur 1 recorded relatively low percentage of deadhearts (5.6%) and whiteears (6.6%) indicating its moderate resistance to stem-

borer as well as recording normal yield of 4995 kg/ha under unprotected condition as against 12.3 per cent DH and 13.3 per cent WE and yield of 4070 kg/ha in Jaya (Table 3)

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