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Reaction of Some Pre-Release Cultures to Paddy Pests and its Yield Potential

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Although good progress has been made to develop varieties resistant/tolerant to pests, use of insecticides in a limited way would continue as one of the components of pest control (Kalode, *et al.* 1977). Host plant resistant and need based chemical control are the two major components of IPM. Gangawar and Dasgupta (1986) also opined that routine chemical protection was uneconomic, whereas supervised control based on need has been recommended. Therefore, it is highly essential to generate information on the cultures towards reaction to insect pests and yield potential prior to their release. Keeping this view in mind the present study was carried out to evaluate the level of resistance in some of the pre-release cultures against major paddy pests which ultimately determine the degree of protection to be offered for achieving maximum yield.

For the purpose, a field trial was laid-out in split plot design with four replications at the Main Rice Research Station, Gujarat Agricultural University, Nawagam (Gujarat).

TABLE 1

Details of cultures/varieties used in study.

Culture/variety	*Cross*	*Grain type*
IET-12875	Swarnadhan x RP-2579-37	LB
IET-11768	Ratna x ARC 5984	LS
IET-13998	IET-5656 x RP-1579-37	LS
IET-12769	IET-7302 x IET-6262	LS
IET-12537	Ratna x ARC 10654	LS
Narmada	T. N. 1 x Basmati 370	LS
Jaya	T. N. 1 x T. 141	LB
GR-11	Z-31 x IR-8-246	LS

LB = Long and bold LS = Long and slender

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during *kharif* 1996. Need based plant protection (P_1) and no protection (P_2) throughout the crop period were the main plot treatments. The sub-plot treatments comprised of six pre-release (Table 1) cultures/varieties alongwith Jaya as susceptible check and GR-11 a local high yielding variety (susceptible check) were also included for comparison. Gross and net plot size were 5.0 x 4.95 and 3.8 x 3.75 m, respectively. Seedlings were transplanted at 20 x 15 cm spacing during first week of August 1996. Need based application of carbofuran 3G (0.75 kg a.i./ha) and monocrotophos 36 WSc (0.75 kg a.i./ha) were given on 23rd September and 8th October 1996, respectively.

TABLE 2

Incidence of leaf folder and white backed plant hopper in different cultures/varieties of paddy.

Treatments	*% leaves damaged by LF*	*Mean No. of WBPH/ hill*	*Yield (kg/ha)*	
			Grain	*Fodder*
Main plots				
P_1 = Protected	3.60	13.89	3327	5272
P_2 = Unprotected	10.35	19.41	2054	4921
S. Em. ±	0.24	1.65	65.18	118.5
C. D. at 5%	1.06	MS	293.30	NS
C. V. (%)	19.18	17.57	13.71	13.19
Sub-plots				
IET-12875	6.34	24.46	0899	2789
IET-11768	6.47	22.26	2311	4000
IET-13998	6.70	8.15	3689	6026
IET-12769	6.44	10.35	4136	6921
IET-12537	7.00	8.96	3987	7175
Narmada	3.94	8.24	3895	6474
Jaya (Check)	9.60	26.19	1373	3624
GR-11 (Check)	9.33	24.60	1232	3772
S. Em. ±	0.55	2.18	120.8	230.3
C. D. at 5%	1.58	6.59	344.9	657.6
C. V. (%)	22.43	17.28	12.70	12.78

NS = Not Significant.

Incidence of leaf fodder (LF), *Cnaphalocrocis medinalis* Guen and white backed plant hopper (WBPH), *Sogatella furcifera* (Horv.) were observed during the season. Observations on LF and WBPH were recorded when the incidence was at peak level. For the purpose, total number of leaves and LF damaged leaves were counted in 10 hills selected randomly from net plot. Similarly, WBPH populations were recorded from 10 hills in net plot area. The crop was harvested during first week of November. At harvest, grain and fodder yields were recorded separately from each net plot. Data obtained were statistically analyzed and presented in Table 2.

Results (Table 2) revealed that the incidence of LF was significantly reduced due to need based plant protection over unprotected plots. Similarly, hopper population was lowered in the former treatment than the latter, however, the difference was not enough to prove the superiority of the chemical treatments. Anonymous (1996) also reported that the need based protection lowered the population of WBPH in all the test entries. Pest incidence differed significantly amongst the cultures evaluated. Significantly least (3.94%) damage of LF was noticed in variety Narmada. Both the susceptible check (Jaya and GR-11) exhibited highest (9.33 to 9.60%) incidence of the pest. Remaining cultures showed damage ranging from 6.34 to 7.0% incidence. The differences among cultures/varieties with regard to WBPH population were significant. Significantly low (8.15 to 10.35 hopper /hill)population of WBPH recorded in the cultures of IET-13998, Narmada, IET-12537 and IET-12769 than the susceptible checks (24.46 to 24.60 hoppers/hill).

Grain yield was significantly enhanced due to need based application of plant protection treatments, however, it did not influenced fodder yield. Increase in grain yield Irrespective of cultures owing to chemical treatments was about 12.73 q/ha (61.97%). Increase in yield from 16.74 to 31.32 q/ha with chemical protection as compared to that of without protection reported by Yein and Rahman (1984) supports the present findings. Significantly highest (4136 kg/ha) grain yield was registered in culture IET-12769 followed by IET-12537, Narmada and IET-13998. More or less similar trend was noticed in case of fodder yield. As per the report of Anonymous (1996), the IET-12769 followed by IET-13998 under protected and IET-13998 followed by IET-12769 under unprotected conditions were the best yielder, are in accordance with present results. The culture IET-12875 produced lowest grain and fodder yields.

Based on pest incidence and yield potential, it can be concluded that the cultures IET-12769, IET-12537 and IET-13998 could be judged as promising pre-release cultures. These cultures can be used as donors for generating resistant breeding lines for crop improvement programme.

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