

SEARCH FOR FIELD TOLERANCE TO FUNGAL AND VIRUS DISEASES IN CHILLIES

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Various plant protection schedules for the control of diseases in chilli have been advocated, however, the increased cost of chemicals and their hazards have become limiting factors in the use of these control measures. Most of the resistant varieties have been found associated with undesirable horticultural characters (Kaur *et al.*, 1986). Therefore, studies were conducted to identify field tolerant genotypes to potentially important diseases (Table 1) with acceptable horticultural characters which could be used in preventing yield losses.

Table 1. Disease of Chilli/*Capsicum* prevalent under Punjab conditions

Disease	Pathogens
Fruit rot	<i>Colletotrichum capsici</i> , <i>Alternaria</i> Sp.
Wet Rot	<i>Choanephora/Cucurbitarum</i>
Die back	<i>C. capsici</i>
Viruses	Leaf curl, mosaic

The screening programme was carried out at the vegetable Farm, P.A.U. during the years 1988-1993. One hundred and fifty genotypes, comprising varieties, hybrids and segregating lines were sown in the month of October and were transplanted in the month of February in a randomised block design with three replications on ridges made 60 cm apart. The plant to plant distance was 30 cm apart. The data were recorded on viral (leaf curl and mosaic) and fungal diseases (fruit rot, die back and wet-rot) during July to September when the respective disease appeared in a severe form on the susceptible varieties. The scoring of fungal diseases was done on -4 scale (Kaur *et al.*,

1989) and the plants were grouped as immune (D.I = 0, resistant (D.I. 0.1-1.5) and moderately resistant (D.I. 1.6 2.0) and susceptible (D.I. 2.0-4.0). The viral symptoms were grouped as immune (no symptoms), resistant (mild symptom), moderately resistant (moderate symptoms) and susceptible (severe symptoms). The data on horticultural traits like fruit yield, fruit number, fruit weight and fruit size were recorded on five selected plants in each replication.

The chilli genotypes screened represented a wide range of responses to various diseases. No genotype could be identified which is resistance to all the diseases. The varieties, Perennial and Lorai were recorded resistant to fruit rot and viral diseases, however, they were highly susceptible to dieback and wet rot diseases (Kaur *et al.*, 1985, 1989). Varieties like BG-1 and Suryamani were resistant/moderately resistant to various diseases but they could not be exploited as commercial varieties due to either poor yield or small size fruit. (Table 2).

Table 2. Performance of multiple resistant genotypes for fruit characters

Genotypes	Disease reaction					Fruit characters			
	Fruit rot	Die back (%)	Wet rot	Mosaic	Leaf curl	Fruit yield gm (plant)	Fruit no/ plant	Mean fruit wt. (gm)	Mean fruit length (cms)
BG-1	1.4	2-5	1.33	R	R	200.40	163.27	1.23	5.60
Suryamani	1.6	10-20	2.76	R	R	192.08	150.45	1.28	2.57
Loral	1.0	40-50	2.86	R	R	98.33	116.30	0.85	3.75
Perennial	1.2	30-50	3.00	R	R	302.98	400.20	0.75	3.18
S 20-1	1.00	5-10	2.20	R	R	256.68	262.07	0.98	4.04

On the basis of excellent performance with respect to resistance/tolerance and yield attributes, the genotypes (Table 3) i.e., Punjab Lal, ELS-2, Indonesia Selection, LLS and F₁ hybrid (CH-1) were identified as having tolerance to various diseases in addition to acceptable horticultural characters. The highest fruit number was recorded in Punjab Lal followed by Indonesia selection and F₁ hybrid; whereas the maximum fruit weight was recorded in LLS followed by ELS-2 and CH-1. The fruit length was more in ELS-2 followed by Pusa Jwala and LLS. These factors ultimately affected the fruit yield which was maximum in CH-1 followed by ELS-2 and Indonesia Selection, whereas the yield of a commercial variety Pusa Jwala was lower than the above mentioned varieties Table 4. The use of these tolerant genotypes is a hopeful approach in stabilizing chilli production.

Table 3. Performance of promising genotypes for various diseases

Varieties	Fruit rot	Die back	Wet rot	Mosaic	Leaf curl
CH-1	2.30	5-10	1.25	R	R
Punjab Lal	1.90	5-10	2.50	R	R
ELS-2	2.36	5-10	2.01	R	MS
Indonesia Sel.	2.40	5-10	2.40	R	R
LLS	2.20	2-5	2.80	S	S
Pusa Jwala	3.10	5-10	2.40	R	MR

Table 4. Fruit characters and yield of promising genotypes

Genotypes	Fruit no. per plant	Fruit weight (gm) per plant	Fruit length (cm)	Mean yield Q/ha
Punjab Lal	628.70	0.89	4.30	60.56
Ch-1	334.10	2.72	6.62	100.78
ELS-2	227.50	3.20	9.16	95.48
Indonesia Selection	450.20	1.32	5.80	77.14
LLS	220.00	3.39	8.17	52.95
Pusa Jwala	269.20	1.64	8.32	65.41

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