

SCREENING OF FRENCH BEAN GENOTYPES AGAINST SUCKING PESTS

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ABSTRACT

Ten French bean genotypes viz., GR-1, VL-1, VL-125, HUR-701, HUR-137, ARUN, PDR-14, R-76, R-79 and UTKARSH were screened against major sucking pest like aphid, white fly, leaf hopper and thrip. Based on mean value of different sucking pests/plant, cut off value was calculated applying formula proposed by Rana et al. (1975). Out of ten genotypes screened, R-79 found resistant against aphid, white fly and thrip. Genotypes VL-1 and R-76 showed resistant against leafhopper and aphid, respectively. While, rest of the genotypes viz., GR-1, VL-125, HUR-701, HUR-137, ARUN, PDR-14, and UTKARSH did not withstand the attack of sucking pests and recorded as a susceptible source of French bean.

KEY WORDS: French bean, genotypes, resistant, sucking pests

INTRODUCTION

Pulses play a very important role in the predominantly cereal based Indian diet. They contain two to three times more protein than cereals. In our country, the green pods of french bean used as vegetable are traditionally known as *fanasi* while, dry grains are called *rajmash*. French bean is highly nutritious containing 22.9 % protein, 1.3 % fat, 60.6 % carbohydrates and minerals, viz. calcium (260 mg), phosphorus (410 mg) and iron (5.8 mg) per 100 gm of seed weight. It is grown in an area of about one lakh ha with a production of 1000 tonnes per year mainly in the states of Maharashtra, Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh (Nilgiri), Tamil Nadu (Palni hills) Kerala, Karnataka (Chickmangalur) and West Bengal (Darjeeling hills) (Prasad, 2005). About 30 species of insects have been reported damaging French bean (Srivastava and Butani, 1998). Among these, sucking pests like aphid, leaf hopper,

whitefly and thrips cause considerable losses in the yield by sucking the sap from the ventral surface of leaves. As a result of their feeding, the affected parts become yellowish, leaves wrinkle, curl downwards and ultimately shed.

MATERIALS AND METHODS

The study on varietal screening of insect pests against French bean was carried out at Agronomy Instructional Farm, Chimanbhai Patel College of Agriculture, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during the year 2011-12. Ten genotypes viz., GR-1, VL-1, VL-125, HUR-701, HUR-137, ARUN, PDR-14, R-76, R-79 and UTKARSH were screened. The experiment was carried out applying Randomizing Block Design replicated thrice during *rabi* season. Five plants from each plot were selected randomly and tagged to record the observation on sucking pest population. Observations were recorded at weekly interval during morning hours starting from two weeks

after sowing to maturity of the crop. The mean value of different sucking pest was calculated/plant. Cut off value (Mean – S.D) was calculated applying formula proposed by Rana *et al.* (1975). On the basis of the formula, the genotypes which harboured less mean population than cut off value were categorized as resistant and which supported more population than cut off value were considered as Susceptible designated as ‘R’ and ‘S’, respectively.

RESULTS AND DISCUSSION

The results presented in table 1 revealed that out of ten genotypes of French bean, R-79 and R-76 were found resistant against aphid, which exhibited aphid population less than cut off value (2.74 aphids/plant). However, remaining genotypes viz., GR-1, VL-1, VL-125, HUR-701, HUR-137, ARUN, PDR-14 and UTKARSH recorded mean aphids population more than cut off value ranged between 3.07 and 4.00 aphids/plant were considered as susceptible genotypes against aphid. Only one genotype VL-1 recording 2.14 leafhoppers /plant and found resistant against leafhopper while, remaining 9 genotypes viz., GR-1, VL-125, HUR-701, HUR-137, ARUN, PDR-14, R-76, R-79 and UTKARS recorded higher (2.60 to 3.40 leafhoppers/plant) leafhopper population than cut off value (2.43 leafhopper/plant) denoted as susceptible “S”genotypes. The genotypes R-79 was resistant by recording 1.59 whiteflies/plant while remained genotypes were susceptible to whitefly by harbouring 2.04 to 2.52 white flies/plant. French bean genotypes R-79 also performed as resistant source against thrips by recording 1.70 thrips/plant which is less than cut off value (1.73 thrips/plant) while, remained genotypes were found susceptible. It is cleared that genotype R-79 showed resistant against major sucking pests and hence, could be included in further research program to develop sucking pest resistant cultivar of French bean. The results could not be

compared with work done elsewhere as these genotypes were not screened by other research workers. However, Jesus *et al.* (2010) screened different fourteen French bean genotypes against white fly under field conditions in the dry and rainy season in Brazil and found that genotypes IAC-Una and LP 02-130 recorded the least white fly population.

CONCLUSION

From the present investigation, it can be concluded that genotype, R-79 found resistant against aphid, whitefly and thrips while, VL-1 was resistant against leafhopper. The remained genotypes, GR-1, VL-125, HUR-701, HUR-137, ARUN, PDR-14, R-76 and UTKARSH were found susceptible to all sucking pests.

REFERENCES

- Prasad, R. (2005). Field crops production, Directorate of Information and publication of Agriculture. Indian Council of Agricultural Research, Krishi Anusandhan Bhavan, Pusa, New Delhi – 110012.
- Rana, B. S., Tripathi, D. P., Balakotaiah, K., Damodar, R. and Rao, N. G. P. (1975). Genetic analysis of some exotic X Indian crosses in sorghum. Selection for shootfly resistance. *Indian J. Genet. Pl. Breed.*, **35**: 350-355.
- Srivastava, K. P. and Butani, D. K. (1998). Pest management in vegetables (Part- I), Published by Research Periodicals and Book Publishing House, P.O. Box 720728, Houston, Texas - 77272, USA.
- Jesus, F.G., Boica Junior, A.L., Carbonell, S.A.M., Stein, C.P. and Chiorato, A.F. (2010). Infestation of *Bemisia tabaci* biotype B and *Caliothrips phaseoli* on bean genotypes. *Bragantia*, **69** (3):637-647.

Table 1: Screening of different genotypes against sucking pests of French bean

Sr. No.	Genotypes	Sucking pests/plant			
		Aphid	Leafhopper	Whitefly	Thrips
1	GR-1	4.00 S	3.40 S	2.52 S	2.34 S
2	VL-1	3.11 S	2.14R	2.05 S	1.91 S
3	VL-125	3.20 S	2.57 S	2.04 S	1.90 S
4	HUR-701	3.07 S	2.65 S	2.10 S	1.96 S
5	HUR-137	3.94 S	3.35 S	2.48 S	2.30 S
6	ARUN	3.19 S	2.71 S	2.00 S	1.86 S
7	PDR-14	3.22 S	2.74 S	2.03 S	1.88 S
8	R-76	2.55 R	2.81 S	2.08 S	1.94 S
9	R-79	2.52 R	2.66 S	1.59R	1.70R
10	UTKARSH	3.46 S	2.83 S	2.09 S	1.95 S
Mean		3.23	2.79	2.10	2.01
S.D.		0.49	0.36	0.26	0.28
Cut off value = Mean-S.D.		2.74	2.43	1.84	1.73

R = Resistant, S=susceptible

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