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RESEARCH ARTICLE

Screening of different varieties of pigeonpea against pod borer complex

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ABSTRACT

An experiment was conducted to screen ten varieties of pigeonpea for their resistance/tolerance to podborers under natural infestation in pesticides free open field. While testing varieties of pigeonpea resistance against podborers, it was obsorved that BSMR-853 was found the least susceptible (1.39 larvae/plant) and it was at par with variety AGT-2 (1.61 larvae/plant). The varieties ICPL-87119 was found highly susceptible with 5.63 larvae per plant. However, among all the varieties of pigeonpea, BSMR-853 recorded lower per cent pod damage due to pod borer (18.59 %) which was at par with AGT-2 (20.9 %). The highest pod damage was recorded on variety ICPL – 87119(36.56 %).in case of per cent seed damage, among all the varieties of pigeonpea, BSMR-853 recorded lower per cent seed damage due to pod fly (7.50 %) which was at par with AGT-2 (8.55 %). The highest pod damage was recorded on variety ICPL–87119.

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INTRODUCTION

Pigeonpea [*Cajanus cajan* (L.) Millsp.] is an important pulse-cum-grain legume crop in semi-arid tropical and subtropical areas of the world. The food value of pigeonpea is the most essential due to its protein content (22.3 %) and also rich in iron, iodine and essential amino acids like lysine, cystine and arginine. More than 200 species of insects have been found feeding on pigeonpea, although only a few of them have been found to cause significant and economic damage to the crop. Naresh *et al.* (1984) revealed that pod and grain damage caused by the pests was 40.36 per cent to pigeonpea. Rahman (1989) reported pod borer complex with 47.92 per cent infestation which reduced the grain yield up to 250.63 kg/ha. Sahoo and Senapati (2000) revealed that a yield loss of 27.77 and 14.28 kg/ha was obtained for each unit increase in larval population and for every unit per cent increase in pod damage, due to the pod borer complex. Though pod borers incidence can be controlled by application of chemicals and variety possessing inbuilt resistance to the pest, will be preferred to its manifold advantages like low input cost besides eliminating residue problem and environmental pollution. Hence an experiment was conducted to screen and evaluate the varieties which resistance to pod borers in pigeonpea.

MATERIAL AND METHODS

Pigeonpea varieties comprising ten accessions were screened in replicated trial. The open field screening technique using natural pest population was followed at Junagadh Agricultural University, Junagadh. All the recommended agronomical practices were adopted to raise varieties. Ten plants were randomly selected from each plot. Each plant was

examined thoroughly and absolute larval populations of pod borers were recorded at weekly intervals after appearance of the pest. Numbers of healthy and damaged pods per plant were recorded at harvest. The data thus obtained were analyzed statistically.

RESULTS AND DISCUSSION

The results Table 1 showed that among ten varieties presented in Table 1, none was found free from infestation of the pest. The mean *H. armigea* population ranged from 1.39 to 5.63 larvae/plant on different pigeonpea varieties. Among the ten varieties under test, BSMR-853 was found the least susceptible (1.39 larvae/plant) and it was at par with variety AGT-2 (1.61 larvae/plant). The varieties ICPL-87119 was found highly susceptible with 5.63 larvae per plant and it was at par with GT-1(5.30 larvae/plant). The remaining varieties GT-103, GT-101, GT-102, BDN-2, GT-100, and BSMR-736 with 2.0, 2.70, 3.31, 3.88, 4.41 and 4.42 larvae per plant were found moderately susceptible to *H. armigera*, respectively which are in agreement with Patel and Patel (1990) who reported that among 26 varieties tested, none of the entries was completely free from the incidence of *H. armigera*, and this finding was inconformity with Borad *et al.* (1991) who reported higher yield potential of some pigeonpea genotypes showing lesser incidence of pod borer.

In case of *M. testulalis* (Table 1), among the ten varieties BSMR-853 was found the least susceptible (1.80 larvae/plant) and it was at par with variety AGT-2 (2.13 larvae/plant). The varieties ICPL-87119 was found highly susceptible with 6.11 larvae per plant and it was at par with GT-1(5.90 larvae/plant). The remaining varieties GT-103, GT-101, GT-102, BDN-2, GT-100, and BSMR-736 with 3.24, 3.32, 3.91, 3.88, 4.14 and 4.43 larvae per plant were found moderately susceptible to *M. testulalis*, respectively. According to early workers, Sahoo and Patnaik (1993) showed that late-maturing varieties suffered less pod damage, particularly by *H. armigera* and *M. testulalis*

Table 1 : Mean population of *H. armigera* and cowpea podborer, *M. testulalis* on different varieties of pigeonpea

Sr. No.	Varieties	Mean no. of larvae/plant *H. armigera*	Mean no. of larvae/plant *M. testulalis*
1.	GT-1	2.31 (5.30)	2.38 (5.90)
2.	GT-100	2.09 (4.41)	2.09 (4.40)
3.	GT-101	1.63 (2.70)	1.81 (3.32)
4.	GT-102	1.80 (3.31)	1.97 (3.91)
5.	GT-103	1.43 (2.00)	1.79 (3.24)
6.	BSMR-736	2.10 (4.42)	2.11 (4.43)
7.	BDN-2	1.97 (3.88)	2.03 (4.14)
8.	BSMR-853	1.18 (1.39)	1.22 (1.80)
9.	ICPL-87119	2.43 (5.63)	2.47 (6.11)
10.	AGT-2	1.27 (1.61)	1.46 (2.13)
	S. Em. ±	0.114	0.101
	C.D. (P=0.05)	0.340	0.302
	C.V. %	10.89	9.12

Table 2 : Mean per cent pod damage by pod borer on different varieties of pigeonpea

Sr. No.	Varieties	Mean per cent pod damaged by pod borers at harvest
1.	GT-1	36.54 (35.45)
2.	GT-100	35.28 (33.35)
3.	GT-101	32.70 (29.19)
4.	GT-102	33.22 (30.01)
5.	GT-103	32.29 (28.54)
6.	BSMR-736	34.89 (32.72)
7.	BDN-2	33.63 (30.66)
8.	BSMR-853	25.54 (18.59)
9.	ICPL-87119	37.20 (36.56)
10.	AGT-2	27.21 (20.90)
	S. Em. ±	1.72
	C.D. (P=0.05)	4.96
	C.V. %	9.07

Table 3 : Mean per cent seed damage by pod fly, *M. obtuse* on different varieties of pigeonpea

Sr. No.	Varieties	Mean per cent seed damaged by pod fly at harvest
1.	GT-1	22.43 (14.56)
2.	GT-100	21.96 (13.98)
3.	GT-101	20.46 (12.22)
4.	GT-102	21.65 (12.61)
5.	GT-103	20.26 (11.99)
6.	BSMR-736	21.33 (13.23)
7.	BDN-2	20.97 (12.81)
8.	BSMR-853	15.98 (07.50)
9.	ICPL-87119	23.30 (16.64)
10.	AGT-2	17.00 (08.55)
	S. Em. ±	1.18
	C.D. (P=0.05)	3.41
	C.V. %	9.97

as compared to extra-early or early varieties and yields of 143-1255 kg/ha were obtained.

The data presented in Table 2 reveal that none of the variety was found free from incidence of pod borer damage. However, among all the varieties of pigeonpea, BSMR-853 recorded lower per cent pod damage due to pod borer (18.59 %) which was at par with AGT-2 (20.9 %). The highest pod damage was recorded in the variety ICPL – 87119 (36.56 %) which was at par with GT-1, GT-100 and BSMR-736 with 35.45, 33.35 and 32.72 per cent pod damage, respectively. The remaining varieties BDN-2, GT-102, GT-101, and GT-103 were found moderately susceptible to pod borer by registering 30.66 to 28.54 per cent pod damage, respectively. The present study also supports the finding of Anitha *et al*. (2006) who found lower percentage of pod damage and observed loss of grain yield < 29 per cent in genotype ICPL 332, ICPL 84060 and ICPL 187-1 as compared to 87.2 per cent in ICPL 87.

The data presented in Table 3 reveal that none of the variety was found free from incidence of pod fly damage. However, among all the varieties of pigeonpea, BSMR-853 recorded lower per cent seed damage due to pod fly (7.50 %) which was at par with AGT-2 (8.55 %). The highest pod damage was recorded on variety ICPL – 87119(16.64 %) which was at par with GT-1, GT-100 and BSMR-736, with 14.56, 13.98 and 13.23 per cent pod damage, respectively. The remaining varieties BDN-2, GT-102, GT-101, and GT-103 were found moderately susceptible to pod fly which registered 12.81 to 11.99 per cent pod damage, respectively. Patel *et al*. (1994) studied the susceptibility of pigeonpea genotypes to *H. armigera, M. liophanes* and *M. obtusa* at Anand (Gujarat). Genotype GAUT 82-90 was found least susceptible to all 3 insect pests with the highest yield potential.

Based on the above study, higher grain yield and lower susceptibility to pod borer was recorded in AG-2. Hence, this line can be used as resistanst variety to the pod borer complex of pigeonpea.

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