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Field Screening of Certain Pigeonpea Genotypes Against Gram Pod borer (*Helicoverpa armigera*) and Pod fly (*Melanagromyza obtusa*)

Key words : *Helicoverpa*, *Melanagromyza*, Pigeonpea Genotypes, Screening

Pigeonpea (*Cajanus cajan* (L.) Millsp.) is an important pulse crop of India. The major limiting factors in its productivity is the damage caused by insect pests especially pod borer complex *viz.*, gram pod borer (*Helicoverpa armigera)*, pod fly (*Melanagromyza obtusa*) and plume moth (*Exelastis atomosa*) which cause upto 70-80% losses during epidemic years and the losses due to *H. armigera* alone extend upto 40% (Adgokar *et al.,* 1993). Development of varieties with resistance to these pests is valuable for subsistence farming in developing countries (Sharma *et al.,* 2005). Several pigeonpea genotypes with resistance to pod borer and pod fly have been identified (Patnaik *et al*., 1989; Borad *et al*., 1991; Kalariya *et al*., 1998). However, information on relative resistance of certain newly developed entries of pigeonpea to these pests is not available. Hence, the present experiment was conducted to screen certain pigeonpea entries against *H. armigera* and *M. obtusa* under field conditions at Regional Agricultural Research Station, Warangal during *Kharif*, 2006.

Nine genotypes of pigeonpea including seven entries of Advanced Varietal Trial *viz.,* JSA-73, WRG-123, JSA-41, BDN-2001-9, WRG-65, BDN-2001-6, WRG-55 and two checks ICPL-87119, BDN-2 were sown in a randomized block design with three replications. Each entry was sown in 14.4 m^2 plot with 90 cm inter row spacing and 20 cm intra row spacing. The soil was clay loam in texture. The crop was grown following all the recommended package of practices. However, no plant protection measures were adopted. Phenological observations like number of days to 50% flowering and days to maturity were recorded in each entry. Pod damage by *H. armigera and M. obtusa* were assessed by collecting total pods from five randomly selected plants in each entry in each replication at the time of harvest. Pod damage was recorded by counting number of damaged pods by pod borer and pod fly separately. Seed yield per plot was recorded at the time of harvest. The per cent pod damage was transformed to Arc Sine values and subjected to statistical analysis.

The data recorded on number of days to 50% flowering and days to maturity, pest incidence and yield are presented in Table 1. Per cent pod damage by *H. armigera* varied from 19.01 to 31.30 and that by *M. obtusa* varied from 43.94 to 62.15 among different pigeonpea genotypes. The check varieties BDN-2 and ICPL-87119 recorded pod borer damage of 19.82 and 23.10 %, respectively. All the test entries including BDN-2 except JSA-73 suffered equivalent pod borer damage to ICPL 87119. Lowest pod borer damage of 19.01% was observed in the entry WRG-55. The entries BDN 2001-6, WRG-65, WRG-123 and two checks ICPL- 87119, BDN-2 with pod damage in the range of 19.82 to 23.26% were at par with WRG-55. Highest pod borer damage by *H. armigera* was found in the genotype JSA-73. This was significantly more compared to all other genotypes except JSA 41, BDN-2001-9.

All the test entries including checks suffered high pod fly damage. The checks BDN-2, ICPL-87119 recorded 60.79 and 62.15% pod fly damage respectively. The entries WRG-123, BDN-2001-9, BDN-2001-6 and JSA-41,WRG-55 recorded significantly lower pod fly damage than ICPL-87119. Locally developed entry WRG-55 produced significantly highest yield of 1378 kg/ha, 20.42% higher than the check ICPL-87119 (1087 Kg/ha). Another Warangal culture WRG-123 also performed well by producing 1156 kg/ha.

There were only marginal, though significant, differences in pod borer damage among the test entries. However, none of the entries were resistant to pod fly. Though the entries WRG-65, BDN-2001-6, WRG-55 and BDN-2 recorded equivalent pod damage of about 20%, their yield levels differed significantly. Both the lowest yielder BDN-2 and highest yielder WRG- 55 were among this group. This indicated that the entry WRG-55, though,

Table 1. Damage caused by *H.armigera* and *M.obtusa,* days to 50% flowering, maturity and yield performance of certain pigeonpea genotypes

Entry	Days to 50% flowering	Days to maturity	Mean per cent pod damage		Yield ($kgha^{-1}$)
			H. armigera	*M. obtusa*	
JSA-73	142	176	31.30 (33.99)	53.23 (46.86)	972
WRG-123	145	183	23.26 (28.84)	52.46 (46.40)	1156
JSA-41	143	180	26.81 (31.19)	51.36 (46.01)	580
BDN-2001-9	143	181	29.54 (32.77)	43.94 (41.45)	677
WRG-65	137	179	20.53 (26.83)	60.27 (50.96)	806
BDN-2001-6	141	179	20.03 (26.56)	52.36 (46.36)	507
WRG-55	143	182	19.01 (25.81)	50.92 (45.53)	1378
ICPL-87119 ©	145	181	23.10 (28.73)	62.15 (52.05)	1087
BDN-2 ©	146	183	19.82 (26.38)	60.79 (51.25)	371
SEm ±	-	-	1.62	1.86	58
CD at 5%	-	-	4.86	5.57	173

* The figures in parentheses are Arc Sine transformations

suffered pod borer damage of 19.01% and pod fly damage of 50.92 %, was able to give highest yield. This could be probably due to its ability to tolerate damage *i.e.,* good recovery resistance following *H. armigera* damage. Similar might be the reason with ICPL-87119 and WRG-123. Existence of all four mechanisms of resistance *viz.,* antixenosis, antibiosis, tolerance and avoidance were reported in pigeonpea (Dua *et al.,* 2005).

The study indicated that certain genotypes like WRG-55, WRG-123 in spite of suffering from moderate pod borer damage gave superior yields and can be recommended wherever pod borer is a major problem.

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