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Screening of Some Pigeonpea (*Cajanus cajan* (L.) Millsp.) Genotypes against Important Insect Pests

Key words : Pigeonpea genotypes, Screening, Pod borer, Pod fly

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Pigeonpea (*Cajanus cajan* (L.) Millsp.) is an important pulse crop grown in rainy season in Andhra Pradesh, India. A large number of insects infest pigeonpea crop at its various growth stages, of which those which attack pods like gram pod borer [*Helicoverpa armigera* (Hubner)], pod fly [*Melanagromyza obtusa* (Malloch)] cause considerable yield losses. Bruchid, *Callasobruchus* spp. is an important storage pest of pulses. It's infestation starts in the field, seeds lose viability and are unfit for consumption (Singh and Singh, 1986). Out of several approaches available for their management, identification and use of resistant varieties is viable and cost effective option as pigeonpea is mostly grown by poor and marginal farmers. Several workers screened different genotypes of pigeonpea for resistance against insect pests (Patel and Patel, 1990; Raut *et al*., 1993; Nanda *et al.,* 1996 and Mandal, 2005). Information on relative resistance of certain newly developed entries of pigeonpea to these pests is not available. Hence, the present study was conducted to screen twenty pigeonpea entries including three released checks for their relative field resistance against *H.armigera*, *M.obtusa*, *Callasobruchus* spp. during *kharif*, 2006 at Regional Agricultural Research Station, Warangal, Andhra Pradesh.

Seventeen genotypes of pigeonpea along with three released varieties *viz.,* ICPL-87119, BDN-2 and WRG-27 (Table) were sown in a Randomized Block Design with two replications each in 10.8 m^2 plots with a spacing of 90 x 20 cm. Sowing was done on first July, 2006 and the crop was grown in clay loam soil under rainfed conditions following all recommended agronomic practices except plant protection measures. Phenological observations on days to 50% flowering and maturity were recorded. Five plants were selected at random in each plot at the time of maturity and total pods were collected from these plants for damage assessment. Damage by pod borer *H.armigera*, pod fly *M.obtusa* and field infestation of bruchids were assessed by counting number of pods damaged by these pests. Seed yield per plot was recorded at the time of harvest. The per cent pod damage and yield were statistically analysed.

The pigeonpea genotypes showed wide variation in the extent of infestation by *H. armigera, M.obtusa* and bruchids, days to 50% flowering, maturity and pod yield (Table). The pod damage was 23.38% due to *H .armigera*, 18.07% due to *M.obtusa* and 3.81% due to bruchids in the local check WRG-27. Only one entry NDA-05-1 recorded significantly low pod damage of 6.64% by *H.armigera*. But, it recorded maximum pod damage of 50.88% by *M.obtusa* compared to all other entries. Late flowering in NDA-05-1 might have resulted in asynchrony with peak pod borer incidence and coincidence with pod fly. This could be the reason for lower borer and higher pod fly damage in NDA-05-1. It suffered bruchid damage of 1.66% on par with WRG-27.

Six genotypes *viz*., AKT-222560, JSA-64, JKM-209, CORG-990015, GRG-206, GRG-261 and released variety, BDN-2 were found susceptible to *H.armigera* with 35.72 to 53.25% pod damage. These entries recorded lower pod fly damage in the range of 8.31 to 29.43 per cent. Singh *et al.* (1993) reported that medium maturing cultivars had more damage by *H.armigera, Exelastis atomosa* Wals, *Lampides boeticus* (Linnaeus) and less damage by pod fly. Significantly lower pod damage of 8.31, 9.27 and 9.86% due to *M.obtusa* was recorded in JKM-209, PT-05-36 and GRG-206, compared to pod fly damage of 18.07% in WRG-27. But, they yielded significantly less grain than the local check because of higher susceptibility to *H.armigera.*

None of the entries were superior to the check WRG-27 in their reaction to field infestation by bruchids. On the other hand, five entries *viz*., JSA-64, BDN-2029, PT-05-36, ASJ-105 and GRG-206 were highly sensitive to bruchids which recorded damage in the range of 11.37 to 29.75%. This was significantly more than that recorded in the check WRG-27 (3.81%).

None of the entries showed consistent response to record significantly low damage to pigeonpea by the three insects *H.armigera, M.obtusa* and bruchids, when compared to WRG-

Table.1 Screening of pigeonpea entries against insect pests

Entry	Days to 50% flowering	Days to maturity	Mean per cent pod damage			Yield (kg/ha)
			H. armigera	*M. obtusa*	Bruchids	
AKT-222560	128	168	36.06 (36.88)*	15.52 (23.02)*	9.39 (3.22)**	741
JSA-64	129	169	48.57 (44.18)	10.56 (18.96)	13.29 (3.78)	847
BDN-2029	135	168	25.01 (30.00)	20.49 (26.75)	18.06 (4.36)	1167
JKE-110	126	171	29.19 (32.69)	25.47 (30.21)	9.30 (3.21)	1014
CORG-990014	133	168	34.67 (36.03)	40.92 (39.78)	5.49 (2.55)	1334
NDA-05-1	143	177	6.64 (14.93)	50.88 (45.51)	1.66 (1.63)	399
PT-05-36	131	168	27.38 (31.47)	9.27 (17.70)	29.75 (5.54)	528
ASJ-105	122	161	21.25 (27.37)	23.89 (29.16)	21.66 (4.76)	394
BRG-2-6	140	181	14.73 (22.54)	38.22 (38.16)	1.98 (1.73)	1112
AKT-221030	127	164	27.42 (31.56)	19.29 (25.92)	4.15 (2.27)	1074
PT-02-9	128	165	23.21 (28.79)	40.05 (39.24)	1.42 (1.55)	1060
JKM-197	130	165	28.11 (31.98)	28.53 (32.28)	9.94 (3.31)	468
JKM-209	131	169	53.25 (46.87)	8.31 (16.36)	6.93 (2.82)	681
JSA-59	131	158	30.50 (33.47)	22.19 (27.93)	7.16 (2.86)	292
CORG-990015	128	172	35.72 (36.69)	18.11 (25.16)	8.35 (3.06)	1153
GRG-206	127	153	48.23 (43.96)	9.86 (18.18)	11.37 (3.52)	301
GRG-261	128	164	43.23 (41.12)	12.17 (20.38)	8.04 (3.01)	597
BDN-2 (c)	131	170	36.58 (37.16)	29.43 (32.85)	3.13 (2.03)	260
ICPL-87119 (c)	131	170	27.45 (31.58)	45.69 (42.53)	6.66 (2.72)	1297
WRG-27 (c)	122	160	23.38 (28.91)	18.07 (25.10)	3.81 (2.19)	1255
SEm±			3.56	3.46	0.58	104
CD at 5%			7.46	7.24	1.21	218

The figures in parentheses are Arc Sine transformations *, (X+1)1/2 transformations**
(c) - Check

27. *Dua et al*. (2005) reported existence of all the four mechanisms of resistance *viz.*, non preference, antibiosis, tolerance and avoidance in pigeonpea. These resistance mechanisms govern the damage levels by a particular insect and hence the variability. However, four entries *viz.*, JKE-110, AKT-221030, JKM-197 and JSA-59 recorded no significant variation in pod damage by the three pests compared to check WRG-27. Only 2 entries were equally productive as the local check. The entry CORG-990014 produced grain yield of 1334 $kgha^{-1}$ and AKT-221030 yielded 1074 $kgha^{-1}$ on par with WRG-27 (1255 kg/ha).

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