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SCREENING OF SOME LONG DURATION GENOTYPES OF PIGEONPEA [*Cajanus cajan* (L.) Millisp.] AGAINST THE INFESTATION OF POD FLY [*Melanagromyza obtusa* (Malloch)]

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ABSTRACT
The present investigation was carried out to screen twenty-five long duration genotypes of pigeonpea, *Cajanus cajan* (L.) Millsp. against pod fly, *Melanagromyza obtusa* (Malloch) at the Agricultural Research Farm of Institute of Agricultural Sciences, Banaras Hindu University, Varanasi during *kharif*, 2014-15. The pest marked its first appearance during 4th standard week and recorded highest mean maggot population in genotype ICPL 84060-1 (1.3 maggots /plant) followed by T-21 (1.2 maggots /plant), ICPHaRL 4979-2 (1.1 maggots /plant), Bahar (check) (1.0 maggots /plant) and lowest in genotype ICP 7035-1 and ICPHaRL 4987-11 (0.2 maggots /plant) followed by genotype ICPHaRL 4989-7, ICPL 88039-1 and ICPX 77303 (0.3 maggots / plant) in the population dynamics study. The per cent pod damage and grain damage due to pod fly on different pigeonpea genotypes differed significantly and ranged from 19.5 per cent in genotype ICP 7035-1 to 54.0 per cent in genotype ICPL 84060-1 and 6.82 per cent in genotype ICP 7035-1 to 26.72 per cent in genotype ICPL 84060-1 respectively. Due to the adverse weather conditions, very low grain yields were recorded but they differed significantly and ranged from 105.6 kg/ha in the genotype ICPL 85063 to 338.9 kg/ha in ICP 7035-1. Genotype ICP 7035-1 performed best in comparison to other genotypes against pod fly infestation.

INTRODUCTION

Pigeonpea [*Cajanus cajan*(L.)Millsp.], an erect, woody, perennial shrub commonly grown as an annual,is an important legume crop of tropical and subtropical environment. India accounts for over 70% of the World's production of pigeonpea but the per capita availability of protein is merely 28 g/day which is much lower than 80g/day *i.e.* the FAO recommended level (Saroj *et al.,* 2013, Nagy *et al.,* 2013, Prasad *et al.,* 2013). Since, the per capita availability of protein in the country is already less than one-third of its requirement and if production of this major pulse is not increased significantly, the problem of malnutrition among the poor will further aggravate (Saxena *et al.*, 2010). The yield potential of present day pigeonpea cultivars is not being realized owing to a number of abiotic (e.g. drought, salinity and waterlogging) and biotic (e.g. diseases like *Fusarium* wilt, sterility mosaic and pod borer insects) stresses (Chethana *et al.,* 2015).The damage caused by insect pests is one of the major reasons of low productivity. Sachan *et al.* (1994) had reported that pigeonpea is attacked by nearly 250 species of insects worldwide belonging to 8 orders and 61 families though relatively few, cause serious yield losses out of which pod fly, *Melanagromyza obtuse* (Mall.) (Diptera; Agromyzidae) is the most devastating pest of pigeonpea in Uttar Pradesh (Pathade *et al.,* 2015). Pod fly infested pods do not show external evidence of damage until the fully grown larvae chew holes in the pod walls. This hole provides an emergence "window" through which the adults exit the pod. To confront against the attack of podfly, chemical insecticides have been used injudiciously and thus have taken a part in degrading the environmental stability (Chandler *et al.,* 2015). To tackle such problems, the utilization of host- plant resistance as the first line of defense is inevitable and should be exploited. Hence, the present experiment was conducted to identify the pigeonpea genotypes that can effectively control the pod fly population and damage in long duration pigeonpea during *Kharif* season of 2014-15.

MATERIALS AND METHODS

The investigation was carried out under field condition at Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University and Varanasi during *kharif*, 2014–15. Twenty five pigeonpea genotypes were grown in plots of 3 rows of 4 m length (total no. of plots, 50) following row to row and plant to plant spacing of 75 cm and 30 cm respectively. The crop was grown following the normal agronomic practices in "Randomized Block Design (RBD)" with two replications. The crop was shown on 5th August 2014 (31st Standard Week) and harvested during 27thApril 2015 (17th Standard Week). The experimental field was manifested to natural infestation and no insecticides were applied. For recording the population of insect pest, five plants were selected randomly from each genotype (each unit plot) and the immature as well as the mature stage of major insect pests present on them were enumerated at weekly intervals, from 24th January to 21st march during 2015.Weekly observations were taken through modified Plant Inspection Method (PIM) starting from seedling stage to till maturity of the crop (Subharani and Singh, 2004). The observation related to pods feeding insect-pest i.e. Pod fly *Melanagromyza obtusa* (Malloch) was recorded. The number of insect count recorded from the two replications for all the genotypes were averaged separately for each genotype on standard week basis. The sampling for pod and seed damage assessment by insect pests was done at 80% maturity of the crop. Five plants from the three central rows in each plot were selected randomly and all the pods from five plants were pooled together and finally 100 pods were picked up for pod and grain damage assessment. The data on per cent pod and grain damage by pod fly *Melanagromyza obtusa* (Malloch) were recorded during investigation. Later, the percent pod and grain damage was worked out using the formulas followed by Cheboi *et al.* (2016):

$$\text{(i) Per cent pod damage} = \frac{\text{Number of damaged pods}}{\text{Total number of pods taken for observation}} \times 100$$

$$\text{(ii) Per cent grain damage} = \frac{\text{Number of damaged grains}}{\text{Total number of grain taken for observation}} \times 100$$

The grain yield was also recorded for each plot after excluding the border rows on the two sides of the plot. The grain yield data for each plot was converted to grain yield in kg/ha. The insect pest resistance/susceptibility rating was done on 1-9 scale (Lateef and Sachan, 1990)then the pest resistance percentage was calculated by using the formula as given below-

$$\text{Pest resistance percentage} = \frac{\text{P. D. of Check - P. D. of test genotype}}{\text{P. D. of Check}} \times 100$$

Where P.D. = Mean per cent of pod damaged.

Statistical analysis

All the data recorded were subjected to statistical analysis as per the Randomized Block Design procedure. The insect population data were transformed with square root transformation $\sqrt{x+0.5}$ method and the pod and grain damage data were angular transformed. The significance in yield difference has been judged using Duncan Multiple Range Test (SPSS).

RESULTS AND DISCUSSION

Incidence and population dynamics of pod fly on pigeonpea

The pest marked its first appearance during 4th standard week in 2014-15 in all genotypes with the maximum population of 0.5 maggots/plant in the genotypes ICPL 84060-1, T 21 and ICPHaRL 4979-2 (Table: 1). The pod fly population persisted from 4th to 12th standard week in all genotypes. The different peak of pod fly population was recorded from 6th to 11th standard week in different genotypes. The peak population of maggot was found in genotype ICPL 84060-1, T-21 and ICPHaRL 4979-2 in 9th standard week with pod fly population of 2.4 maggots /plant, 2.2 maggots /plant and 2.1 maggots /

Table 1: Pod fly *(Melanagromyza obtusa* Malloch) maggot population on certain long duration pigeonpea genotypes during 2014-15

Genotypes	Population per plant									
	4th SW	5th SW	6th SW	7th SW	8th SW	9th SW	10th SW	11th SW	12th SW	Over all mean
ICP 7035-1	0.1(1.06)	0.2(1.07)	0.2 (1.09)	0.2 (1.12)	0.3 (1.12)	0.3 (1.15)	0.3 (1.14)	0.3 (1.13)	0.2 (1.08)	0.2 (1.11)
ICPHaRL 4985-11	0.1(1.06)	0.2(1.07)	0.2 (1.10)	0.3 (1.12)	0.3 (1.13)	0.3 (1.16)	0.3 (1.14)	0.3 (1.13)	0.2 (1.09)	0.2 (1.12)
T 21	0.5(1.23)	0.6(1.25)	0.7 (1.29)	0.8 (1.36)	1.3 (1.50)	2.2 (1.78)	1.9 (1.71)	1.5 (1.58)	1.1 (1.45)	1.2 (1.46)
ICPHaRL 4989-7	0.2(1.08)	0.2(1.08)	0.3 (1.12)	0.3 (1.13)	0.4 (1.16)	0.6 (1.28)	0.4 (1.20)	0.4 (1.18)	0.2 (1.10)	0.3 (1.15)
ICPHaRL 4985-10	0.2(1.10)	0.2(1.11)	0.3 (1.14)	0.4 (1.16)	0.6 (1.25)	0.9 (1.39)	0.7 (1.29)	0.6 (1.26)	0.3 (1.13)	0.5 (1.21)
ICPHaRL 4985-4	0.2(1.12)	0.3(1.14)	0.4 (1.16)	0.4 (1.19)	0.6 (1.28)	1.1 (1.46)	0.9 (1.36)	0.7 (1.30)	0.4 (1.19)	0.6 (1.24)
ICPL 20036-1	0.3(1.16)	0.4(1.18)	0.4 (1.20)	0.5 (1.24)	0.8 (1.34)	1.4 (1.56)	1.3 (1.50)	0.8 (1.34)	0.6 (1.25)	0.7 (1.31)
ICPHaRL 4979-2	0.5(1.21)	0.5(1.23)	0.6 (1.28)	0.8 (1.34)	1.2 (1.47)	2.1 (1.75)	1.8 (1.67)	1.4 (1.55)	1.0 (1.43)	1.1 (1.44)
ICPHaRL 4985-1	0.2(1.09)	0.2(1.10)	0.3 (1.13)	0.3 (1.15)	0.4 (1.19)	0.8 (1.33)	0.5 (1.24)	0.5 (1.22)	0.2 (1.10)	0.4 (1.17)
ICPL 88039-1	0.1(1.07)	0.2(1.07)	0.2 (1.10)	0.3 (1.12)	0.3 (1.13)	0.4 (1.18)	0.4 (1.17)	0.3 (1.13)	0.2 (1.09)	0.3 (1.13)
ICPL 98008	0.2(1.10)	0.2(1.12)	0.3 (1.14)	0.4 (1.17)	0.6 (1.26)	1.0 (1.41)	0.7 (1.31)	0.6 (1.28)	0.4 (1.17)	0.5 (1.22)
ICP 13212-1	0.3 (1.14)	0.4(1.17)	0.4 (1.19)	0.5 (1.23)	0.8 (1.33)	1.4 (1.54)	1.2 (1.47)	0.8 (1.32)	0.5 (1.23)	0.7 (1.30)
ICPL 87119	0.3(1.13)	0.3 (1.15)	0.4 (1.18)	0.5 (1.21)	0.7 (1.31)	1.3 (1.52)	1.1 (1.44)	0.7 (1.31)	0.5 (1.22)	0.6 (1.28)
ICPL 84060-1	0.5(1.24)	0.6 (1.25)	0.7 (1.31)	0.9 (1.38)	1.3 (1.51)	2.4 (1.84)	2.1 (1.75)	1.6 (1.60)	1.2 (1.48)	1.3 (1.49)
ICPL 332 WR	0.4(1.17)	0.4 (1.19)	0.5 (1.21)	0.6 (1.26)	0.8 (1.36)	1.5 (1.59)	1.3 (1.53)	0.9 (1.38)	0.6 (1.27)	0.8 (1.33)
ICP 13198-1	0.3(1.12)	0.3 (1.14)	0.4 (1.16)	0.4 (1.19)	0.7 (1.29)	1.2 (1.49)	0.9 (1.38)	0.7 (1.31)	0.5 (1.20)	0.6 (1.26)
ICPL 909	0.4(1.20)	0.5 (1.22)	0.6 (1.26)	0.7 (1.32)	1.0 (1.42)	1.8 (1.67)	1.6 (1.61)	1.3 (1.53)	1.0 (1.40)	1.0 (1.40)
ICPL 85063	0.4(1.17)	0.4 (1.19)	0.5 (1.21)	0.6 (1.27)	0.9 (1.36)	1.6 (1.60)	1.4 (1.54)	1.0 (1.40)	0.7 (1.29)	0.8 (1.35)
ICPX 77303	0.2(1.08)	0.2 (1.08)	0.2 (1.11)	0.3 (1.13)	0.3 (1.15)	0.4 (1.19)	0.4 (1.18)	0.3 (1.14)	0.2 (1.10)	0.3 (1.13)
ICPL 20062	0.4(1.19)	0.5 (1.21)	0.6 (1.25)	0.7 (1.31)	0.9 (1.38)	1.7 (1.65)	1.5 (1.59)	1.3 (1.50)	0.8 (1.36)	0.9 (1.38)
PPE 45-2	0.4(1.18)	0.5 (1.21)	0.5 (1.25)	0.7 (1.30)	0.9 (1.37)	1.7 (1.64)	1.5 (1.58)	1.2 (1.49)	0.8 (1.34)	0.9 (1.37)
ICP 10531-1	0.4(1.18)	0.4 (1.20)	0.5 (1.23)	0.7 (1.29)	0.9 (1.36)	1.6 (1.62)	1.4 (1.55)	1.1 (1.43)	0.7 (1.30)	0.9 (1.35)
ICPL 97253	0.2(1.12)	0.3 (1.14)	0.4 (1.17)	0.4 (1.20)	0.7 (1.29)	1.2 (1.49)	1.0 (1.40)	0.8 (1.33)	0.5 (1.21)	0.6 (1.26)
ENT 11	0.4(1.19)	0.5 (1.21)	0.6 (1.26)	0.7 (1.31)	0.9 (1.40)	1.8 (1.66)	1.5 (1.59)	1.3 (1.52)	0.9 (1.37)	1.0 (1.39)
BAHAR	0.4(1.20)	0.5 (1.22)	0.6 (1.27)	0.8 (1.33)	1.1 (1.44)	1.9 (1.69)	1.6 (1.63)	1.4 (1.54)	1.0 (1.41)	1.0 (1.42)
SEm±	0.002	0.005	0.003	0.006	0.008	0.016	0.014	0.097	0.004	0.020
CD at 5%	0.006	0.015	0.009	0.017	0.025	0.046	0.040	0.033	0.012	0.056

Figures in parentheses are $\sqrt{x+0.5}$ transformed value SW: Standard Week

Table 2: Comparative performance showing per cent pod damage of some promising pigeonpea genotypes against pod fly during *Kharif* 2014-15

SlNo.	Genotypes	Days to 50% flowering	% Pod damage by pod fly	R/S Rating
1.	ICP 7035-1	106	19.5 (25.78)	3
2.	ICPHaRL-4985-11	93	24.5 (29.31)	4
3.	T-21	108	49.5 (44.69)	6
4.	ICPHaRL-4989-7	103	32.5 (34.74)	4
5.	ICPHaRL-4985-10	94	35 (36.24)	5
6.	ICPHaRL-4985-4	105	36.5 (37.15)	5
7.	ICPL-20036-1	101	39 (38.63)	5
8.	ICPHaRL-4979-2	102	47 (43.26)	6
9.	ICPHaRL-4985-1	104	34.5 (35.93)	5
10.	ICPL-88039-1	100	28 (31.93)	4
11.	ICPL-98008	102	35 (36.16)	5
12.	ICP-13212-1	108	38 (37.99)	5
13.	ICPL-87119	110	37 (37.42)	5
14.	ICPL-84060-1	107	54 (47.35)	7
15.	ICPL-332 WR	109	39.5 (38.87)	5
16.	ICP-13198-1	112	36.5 (37.15)	5
17.	ICPL-909	105	45 (42.10)	6
18.	ICPL-85063	103	40.5 (39.47)	6
19.	ICPX-77303	108	29.5 (32.71)	4
20.	ICPL-20062	105	42 (40.38)	6
21.	PPE-45-2	107	41.5 (40.10)	6
22.	ICP-10531-1	108	40.5 (39.51)	6
23.	ICPL-97253	103	36.5 (36.99)	5
24.	ENT-11	109	42.5 (40.66)	6
25.	Bahar (Check)	92	45 (42.11)	-
	SEm ±		3.33	
	C.D at =0.05%		9.78	

Figure in parentheses are arc-sin transformed values; R-Resistance, S-Susceptible

plant respectively. During the same week the least population of maggots was found in genotypes ICP 7035-1 and ICPHaRL 4985-11 with both having the population of maggots of 0.3 maggots /plant. The rest genotypes noticed pod fly population in 8th, 9th, 10th and 11th standard week. The mean population of maggots was recorded highest in genotype ICPL 84060-1 i.e. (1.3 maggots /plant) followed by genotype T-21 (1.2 maggots /plant), genotype ICPHaRL 4979-2 (1.1 maggots /plant), genotype Bahar (check) (1.0 maggots /plant) and lowest in genotype ICP 7035-1 and ICPHaRL 4987-11 i.e. (0.2 maggots /plant) followed by genotype ICPHaRL 4989-7, ICPL 88039-1 and ICPX 77303 (0.3 maggots / plant). The present findings are in partial agreement with Kumar and Nath (2003), who recorded that pod fly (*Melanagromyza obtusa*) infestation remained from 23 January to 8 April and its peak population was observed on 22 February.Jaisal *et al*. (2010)reported that the incidence of pod fly (*Melanagromyza obtusa*), on long duration pigeonpea genotypes were observed and the densities of mature and immature stages of the pests were evaluated weekly from 13 January 2008 until the harvesting stage. Raj Kumar and Ram Keval (2013) recorded that peak of pod fly population was found during 6th SW to 11th SW.

Extent of damage caused by pod fly on pigeonpea

Pod damage:

The per cent pod damage due to pod fly on different pigeonpea genotypes differed significantly during 2014-15 (Table: 2). Its damage ranged from 19.5 per cent in genotype ICP 7035-1 to 54.0 per cent in genotype ICPL 84060-1. The genotypes ICPHaRL 4958-11, ICPL 88039-1, ICPX 77303 showed comparatively lower pod damage of 24.5, 28.0 and 29.5 per

Table 3: Comparative performance showing per cent grain damage of some promising pigeonpea genotypes against pod fly during *Kharif* 2014-15

Sl No.	Genotypes	% Grain damage by pod fly	R/S Rating
1.	ICP 7035-1	6.82 (14.98)	3
2.	ICPHaRL-4985-11	8.81 (17.02)	3
3.	T-21	22.53 (28.29)	9
4.	ICPHaRL-4989-7	13.92 (21.89)	6
5.	ICPHaRL-4985-10	14.83 (22.64)	6
6.	ICPHaRL-4985-4	15.31 (23.02)	6
7.	ICPL-20036-1	15.65 (23.29)	6
8.	ICPHaRL-4979-2	17.55 (24.75)	7
9.	ICPHaRL-4985-1	16.75 (24.13)	7
10.	ICPL-88039-1	11.48 (19.78)	5
11.	ICPL-98008	13.90 (21.76)	6
12.	ICP-13212-1	16.48 (23.92)	7
13.	ICPL-87119	16.64 (24.05)	7
14.	ICPL-84060-1	26.72 (30.96)	9
15.	ICPL-332 WR	15.64 (23.24)	6
16.	ICP-13198-1	15.07 (22.82)	6
17.	ICPL-909	22.37 (28.19)	9
18.	ICPL-85063	14.74 (22.39)	6
19.	ICPX-77303	12.87 (20.96)	5
20.	ICPL-20062	16.76 (24.15)	7
21.	PPE-45-2	18.19 (25.22)	7
22.	ICP-10531-1	15.27 (22.99)	6
23.	ICPL-97253	17.29 (24.01)	7
24.	ENT-11	17.39 (24.57)	7
25.	Bahar (Check)	14.70 (22.51)	-
	SEm ±	2.05	
	C.D at =0.05%	6.03	

Figure in parentheses are arc-sin transformed values ; R-Resistance, S-Susceptible

Table 4: Yield of pigeonpea genotypes during *Kharif* 2014-15

Sr no.	Genotypes	Mean Grain Yield (Kg/ha)
1.	ICP 7035-1	338.9 a
2.	ICPHaRL-4985-11	233.3 defgh
3.	T-21	150.0 efgh
4.	ICPHaRL-4989-7	227.8 cdef
5.	ICPHaRL-4985-10	166.7 defgh
6.	ICPHaRL-4985-4	333.3 ab
7.	ICPL-20036-1	244.4 bcde
8.	ICPHaRL-4979-2	177.8 defgh
9.	ICPHaRL-4985-1	261.1 abcd
10.	ICPL-88039-1	111.1 gh
11.	ICPL-98008	236.1 cdef
12.	ICP-13212-1	161.1 efgh
13.	ICPL-87119	180.6 defgh
14.	ICPL-84060-1	122.2 gh
15.	ICPL-332 WR	222.2 cdef
16.	ICP-13198-1	186.1 defgh
17.	ICPL-909	166.7 defgh
18.	ICPL-85063	105.6 h
19.	ICPX-77303	155.6 efgh
20.	ICPL-20062	172.2 defgh
21.	PPE-45-2	162.2 efgh
22.	ICP-10531-1	206.7 cdefg
23.	ICPL-97253	138.9 fgh
24.	ENT-11	177.8 defgh
25.	BAHAR (Check)	300.0 abc
	SEm ±	1.09
	C.D at 5%	3.19

cent, respectively, in 2014-15 against check, Bahar (45.0 per cent). Whereas genotypes ICPHaRL 4979-2, T 21 and ICPL 84060-1 showed comparatively higher per cent of pod damage (47.0 per cent, 49.5 per cent and 54.0 per cent, respectively) when checked against Bahar (45.0 per cent). The genotype ICPL 909 showed a 45.0 per cent of pod damage similar to the check (Bahar).The insect pest resistance/susceptibility rating was done on 1-9 scale proposed by Lateef and Sachan (1990) based on the Pest Resistance Percentage values. The per cent pod damage by pod fly in the genotypes screened was found and it depicted that the genotypes ICPHaRL 4979-2, T 21, ICPL 909, ICPL 85063, ICPL 20062, PPE 45-2, ENT 11 and ICP 10531-1 stands equal to check (Bahar) on the resistance/ susceptibility rating scale i.e. 6. The genotype ICPL 84060-1 stands 7 on the rating scale i.e. this cultivar is more susceptible than local check, Bahar. The genotypes ICPHaRL 4985-10, ICPHaRL 4985-4, ICPHaRL 4985-1, ICPL 20036-1, ICPL 98008, ICPL 87119, ICPL 332-WR, ICPL 97253, ICP 13212-1 and ICP 13198-1 had a rating of 5 on the scale which depicts it is less susceptible than local check, Bahar. The genotypes ICPHaRL 4985-11, ICPHaRL 4985-4, ICPL 88039-1 and ICPX 77303 gave 4 on the rating scale i.e. these genotypes are least susceptible when compared with Bahar (check). The genotype ICP 7035-1 had a rating of 3 on the scale that deciphered that this genotype has some resistance when compared with the check cultivar. The present findings are in partial agreement with that of Singh *et al.,* (2001) who screened thirty five genotypes of pigeonpea against the pod fly (*M. obtusa*) in Uttar Pradesh, India and found that the percentage of pod damage caused by the pod fly ranged from 2.6 (genotype KA-35) to 38.2% (T-17; control). In another study conducted by Patra *et al.* (2016) found that the highest pod damage was caused by *M. Obtusa* (Malloch) (44.94%).Srivastava and Mohapatra (2002) reported that the extent of pod damage inflicted by pod fly varied from 15.1 to 33.1%. Khan and Srivastava (2014) reported that the genotype ICPL 84060 can be considered as more susceptible with a pod damage of 38.5 per cent when compared with the check, 'Bahar'.

Grain damage

The per cent grain damage due to pod fly on different genotypes differed significantly during 2014-15 (Table: 3). Its damage ranged from 6.82 per cent in genotype ICP 7035-1 to 26.72 per cent in genotype ICPL 84060-1. The genotypes ICP 7035-1, ICPHaRL 4985-11, ICPL 88039-1, ICPX 77303, ICPL 98008 and ICPHaRL 4989-7 showed comparatively lower per cent grain damage of 6.82, 8.81, 11.48, 12.87, 13.90 and 13.92 per cent respectively in 2014-15 as compared to check, Bahar (14.70 per cent). Whereas all other genotypes showed comparatively higher per cent of grain damage ranging from 14.74 per cent grain damage in ICPL 85063 to 26.72 per cent grain damage in ICPL 84060-1 when checked against Bahar (check cultivar).The insect pest resistance/susceptibility rating was done on 1-9 scale proposed by Lateef and Sachan (1990) based on the Pest Resistance Percentage values. It was found that the genotypes ICPHaRL 4989-7, ICPHaRL 4985-10, ICPHaRL 4985-4, ICPL 20036, ICPL 98008, ICPL 332-WR, ICP 13198-1, ICPL-85063 and ICP 10531-1 stands equal to check (Bahar) on the resistance/ susceptibility rating scale i.e. 6. The genotypes ICP 13212-1, ICPHaRL 4985-1, ICPHaRL 4979-2, ICPL 20062, ICPL 87119, ICPL 97253, PPE 45-2 and ENT 11 stands 7 on the rating scale i.e. they are more susceptible than local check (Bahar). The genotypes T 21, ICPL 84060-1 and ICPL 909 had a rating of 9 and were found to be highly susceptible when compared with the local check, Bahar. The genotypes ICPL 88039-1 and ICPX 77303 had a rating of 5 on the scale which signifies that they are least susceptible when compared with the local check, Bahar. The genotypes ICP 7035-1 and ICPHaRL 4985-11 had a rating of 3 on the scale that enumerates that these genotypes have shown some resistance when compared with the check. The present findings are in partial agreement with Srivastava and Mohapatra (2002) who conducted an experiment where fifteen medium duration pigeonpea genotypes were examined and the pest susceptible rating (PSR) showed that the genotype ICP 8863 suffered the highest pod damage caused by LPBs, while the lowest was in KM 124 and KM 125. None of the genotypes was resistant\tolerant to pod fly. Similarly, Singh *et al.,* (2003) studied the inheritance of pod fly (*Melanagromyza obtusa*) resistance in the genotypes and showed that all the plants of Bahar were rated 7 to 9, indicating a high pest population.

Yields

Since the crop was badly affected by the adverse weather conditions, hence very low grain yields were recorded. The grain yield of different genotypes differed significantly and ranged from 105.6 kg/ha in the genotype ICPL 85063 to 338.9 kg/ha in ICP 7035-1 (Table: 4). The genotypes ICP 7035-1, ICPHaRL 4985-4 showed comparatively higher yield i.e. 338.9 kg/ha and 333.3 kg/ha respectively as compared to Bahar (check cultivar) giving yield of 300 kg/ha. The genotypes ICPL

909, ICPHaRL 4985-10 and ENT 11, ICPHaRL 4979-2 showed similar yield of 166.7 kg/ha and 177.8 kg/ha respectively. The higher yield following after Bahar (check cultivar) was seen in the genotypes ICPHaRL 4985-1 (261.1 kg/ha), ICPL 20036-1 (244.4 kg/ha), ICPL 98008 (236.1 kg/ha) and so on. The present findings are in partial agreement with Ekshinge*et al.* (1996) conducted a trial on the short duration pigeonpea cultivars and found that ICPL-87 was the highest yielding cultivar and had the lowest level of pest infestation.

The pod fly (*Melanagromyza obtusa* Malloch) is the predominant insect pest of long duration pigeonpea in this zone. Among the twenty-five genotypes screened. The genotype, ICP 7035-1 is found to be most resistant against pod fly damage and also gave the highest yield. Thus it can be recommended to farmers for cultivation or can be utilized for further breeding purposes.

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