

Short Communication

Population fluctuations of pod fly on some varieties of pigeonpea

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Pigeonpea (*Cajanus cajan* (L.) Millsp.) is grown throughout the tropics, but most widely in south and south-east Asia, where it is preferred source of vegetable protein. It is one of the major grain legumes in the semi-arid tropics (Nene and Sheila 1990). Pigeonpea yields have remained stagnant for the past 3 to 4 decades, largely due to insect pests' damage. More than 200 species of insects feed on this crop, of which pod fly (*Melanagromyza obtusa* Malloch) is important pest, in addition to ubiquitous pest, *Helicoverpa armigera* (Hub.) (Lateef and Reed 1990, Shanower *et al.* 1999, Kumar and Nath 2003, Kumar *et al.* 2003, Nath *et al.* 2008). Losses due to pod fly damage have been estimated to be US\$ 256 millions annually. Identification and cultivation of cultivars which are less preferred by pod fly have number of advantages, particularly for an eco-friendly management of pigeonpea.

More than 10,000 germplasm accessions have been screened for pod fly resistance (Lateef and Pimbert 1990). However, Singh and Singh (1990) reported that no definite conclusions could be drawn about the relative susceptibility of pigeonpea genotypes to pod fly damage because of staggered flowering and variation in pod fly abundance over time. Since levels of resistance to these pests in the cultivated

pigeonpea are low to moderate, it is important to identify pigeonpea cultivar that permits slow growth or lesser population buildup of pod fly.

The population buildup of pod fly on six long duration varieties of pigeonpea was studied during *kharif* seasons of 2007-08 and 2008-09 at the Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. The experiment was conducted with 3 replications and 6 treatments following factorial randomized block design. The plot size was 4 m x 3.75 m (15 m²) and the row-to-row and plant-to-plant distance were 75 cm and 10 cm, respectively. The pigeonpea cultivars used for study were 'NDA 5-25', 'PDA 85-5E', 'MAL-27', 'KAWR 92-2', 'MAL-13' and 'MAL-20'. The population of pod fly was recorded by observing 10 pods selected randomly out of 100 pods picked up from 5 selected plants from each replication. All the data recorded were subjected to statistical analysis as per the factorial randomized block design procedure.

The first incidence of pod fly was observed in the 4th standard week on 24th January and remained active till 12th standard week in all the varieties. The peak population of pod fly irrespective of variety was in 9th standard week and

Table 1. Pooled data for population of pod fly, *Melanagromyza obtusa* on long duration pigeonpea during 2007-08 and 2008-09

Variety	Maggots/10 pods (no)									Average
	Periods (standard week)									
	4 th S.W. 24 th Jan	5 th S.W. 31 st Jan	6 th S.W. 7 th Feb	7 th S.W. 14 th Feb	8 th S.W. 21 st Feb	9 th S.W. 28 th Feb	10 th S.W. 7 th March	11 th S.W. 14 th March	12 th S.W. 21 th March	
NDA-5-25	0.06 (.77)	0.47 (0.96)	0.23 (0.85)	0.56 (1.01)	0.60 (1.03)	1.26 (1.30)	1.03 (1.21)	0.73 (1.11)	0.46 (0.97)	0.57 (1.01)
PDA85-5E	0.26 (0.86)	0.27 (0.86)	0.26 (0.91)	0.17 (0.81)	0.50 (0.99)	0.76 (1.12)	0.23 (0.84)	0.37 (0.92)	0.33 (0.90)	0.33 (0.90)
MAL-27	0.17 (0.80)	0.17 (0.80)	0.63 (1.05)	0.16 (0.81)	0.36 (0.91)	0.47 (0.97)	0.2 (0.82)	0.23 (0.85)	0.20 (0.83)	0.28 (0.87)
KAWR92-2	0.13 (0.79)	0.13 (0.78)	0.43 (0.95)	0.17 (0.81)	0.40 (0.93)	0.20 (0.83)	0.20 (0.82)	0.10 (0.77)	0.27 (0.81)	0.21 (0.83)
MAL-13	0.10 (0.77)	0.20 (0.83)	0.20 (0.83)	0.43 (0.95)	0.40 (0.94)	0.33 (0.91)	0.36 (0.91)	0.46 (0.96)	0.43 (0.96)	0.31 (0.88)
MAL-20	0.20 (0.86)	0.36 (0.93)	0.33 (0.9)	0.66 (1.04)	0.60 (1.03)	0.57 (1.03)	0.80 (1.13)	0.43 (0.95)	0.30 (0.89)	0.46 (0.97)
Average	0.11 (0.81)	0.27 (0.86)	0.35 (0.92)	0.40 (0.90)	0.48 (0.97)	0.60 (1.03)	0.47 (0.95)	0.39 (0.92)	0.32 (0.89)	0.37 (0.92)

Figures in parentheses are transformed value = $\sqrt{x + 0.5}$
 Difference between varieties (CD: P=0.05) = 0.11
 Difference between periods (CD: P=0.05) = 0.09
 Difference between varieties and periods (CD: P=0.05) = 0.27

thereafter, it declined due to maturity of grains (Table 1). The population in various standard weeks was found in order 9th > 8th > 10th > 7th > 11th > 6th > 12th > 5th > 4th during both the years. The highest mean population of pod fly was recorded in NDA-5-25 (0.57 maggots/ 10 pods), followed by MAL-20 (0.46 maggots/ 10 pods), PDA 85-5E (0.33 maggots/ 10 pods), MAL-13 (0.31 maggots/ 10 plots), MAL- 27 (0.28 maggots/ 10 pods) and the lowest in KAWR 92-2 (0.21 maggots/ 10 pods) during both the years. The present findings are in agreements to the reports of Kumar *et al.* (2003) and Nath *et al.* (2008).

The pod fly population variation in different cultivars may be due to pod character which either attracted or repelled the pod fly for egg laying. The meteorological factors such as temperature and humidity affect the physiological condition of the plant as a whole and particular high temperature dried the pod, making it unfit for egg laying resulting in reduction in population.

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