https://doi.org/10.29321/MAJ.10.A00667

INFLUENCE OF PIGEONPEA POD AND SEED CHARACTERS ON PODFLY (*MELANAGROMYZA OBTUSTA* MALLOCH.) INFESTATION

C.DURAIRAJ,

National Pulses Research Centre,
Vamban Colony – 622 303.
Pudukkottai District.

ABSTRACT

One hundred and one long duration pigeonpea entries were evaluated against pigeonpea podfly, *Melangramyza obtusa* Malloch, damage, at National Pulses Research Centre, Vamban. The biometric observations viz., pod and seed characters were correlated with podfly damage. The results revealed that the podfly damage exerted a negative association with pod length and number of grains per pod and positive association with pod width, grain length and width. About 37 per cent of the variation in the damage was influenced by pod and seed characters. Hence it may be concluded that pigeonpea types having small seed and lengthy pods with more number of grains per pod had low damage and these characters may be used for resistance breeding programme.

KEY WORDS: Pigeonpea podfly damage, Pod and seed characters, Resistance breeding programme.

Podfly *Melanagromyza obtusa* Malloch. (Angromyzidas : Diptera) is one of the important pests of pigeonpea and causes extensive damage to grains which makes them unfit for consumption. In India, it attacks pigeonpea in almost all parts from south to north. The grain yield loss was upto 71% (Lal et al., 1993) in north India and the grain grain damage was upto 68% in South India (Durairaj,1995). The podfly damage could be seen only after splitting open the pods as the maggots are internal feeders. There will not be any visible external symptoms on the pod, as the eggs and early larval stages are inside the pod. Because of the internal feeding nature, the insecticides applied will have only lesser effect and the other way of control is to kill adult flies before egg laying. Nowadays the use of insecticides is being discouraged as it causes various environmental and health hazards. Hence there is a strong need to develop resistant varieties as a factor of host plant resistance. Keeping this in view a field study was conducted at National Pulses Research Centre, Vamban to study the influence of pod and seed character on the podfly damage.

MATERIALS AND METHODS

A total of 101 entries received from Indian Institute of Pulses Research (IIPR), Kanpur, International Crop Research Institute for Semi Arid Tropics (ICRISAT) Hyderabad and Tamil Nadu Agricultural University, Coimbatore were evaluated in the field for their relative resistance/ susceptibility during Kharif, 1994. Each entry was sown in 5m row with a spacing of 0.9m between row and 0.3m between plants. Ten plants in each entry were maintained. At the time of harvest, the grain damage in each entry was assessed by collecting 200 pods at random. The biometric observations on pods such as pod length and pod width were measured when the pods were about 15 to 20 days old. The number of seeds per pod and seed length and width were measured after harvest by observing seeds from 20 pods at random for each entry. A correlation analysis was made with grain damage as dependent factor (Y) and the pod length (X_1), pod with (X_2), number of grains per pod (X_3), seed length (X_4) and grain width, (X_5) as independent characters.

RESULTS AND DISCUSSION

The results of the observations made on the pod characters of pigeonpea are presented in Table 1. The correlation matrix worked out between grain damage and pod characters showed that the damage exerted a negative association with pod length and number of grains per pod and positive association with pod width, grain length and width. All the characters influenced the damage signi ficantly (Table 2). The results of the multiple regression analysis showed R value of 0.37 indi cating that 37 percent of the variation in the damage was influenced by these characters (Table 3). The

Table 1 : Influence pod and seed characters on podfly grain damage (%) in pigeonpea entries.

Sl.No.	Character	Mean SD	Range	Grain damage (%)		No.of entries (n = 101)
1.	Pod Length (cm)	5.2 ± 0.22	Morethan 5.0	26.3	9.0	31
		4.51 ± 0.37	4.1 - 4.9	24.3	9.3	60
		3.69 ± 0.29	Lessthan 4.0	23.0	11.8	10
2.	Pod width (cm)	0.82 ± 0.05	Morethan 0.8	25.0	9.6	79
		0.70 ± 0.00	0.7	24.1	6.2	11
		0.56 ± 0.05	Lessthan 0.69	23.1	11.1	11
3.	Seeds / pod (Nos)	4.1 ± 0.21	Morethan 4.0	24.1	10.2	8
		3.48 ± 0.19	3.1 - 3.9	24.4	9.3	85
		2.9 ± 0.31	Lessthan 3.0	28.8	9.7	8
4.	Seed length (mm)	5.02 ± 0.11	Morethan 5.0	24.5	9.7	69
		4.72 ± 0.11	4.6 - 4.9	25.2	8.9	21
		4.23 ± 0.20	4.0 - 4.5	25.3	9.4	11
5.	Seed width (mm)	5.00 ± 0.00	Morethan 5.0	31.5	9.3	15
		4.45 ± 0.22	4.1 - 4.9	25.5	9.8	32
		3.91 ± 0.19	Lessthan 4.0	22.2	8.2	54

results obtained through the study conclusively revealed that the damage was influenced by these characters (Table 3). The results obtained in the study conclusively revealed that bold seeded types with higher pod width favoured podfly damage. This finding gains support by the earlier work of Veda et al., (1975) and Piraviperumal (1979), who found a positive correlation between the pod width and pod fly infestation. It was also stated that the resistant selections tend to be small seeded and small poded (ICRISAT 1986).

The susceptibility of bold seeded entries and entries with higher pod width may be due to the higher level of oviposition by the female flies, which provide conductive niche for the development of maggots in the larger seeds. Pod width alone had positive correlation with podfly damage. However Thankur et al. (1990) observed a positive correlation between podfly infestation and length and width of the pod. From the present study it may be concluded that about 37% of variation in podfly damage was determined by pod characters and the remaining level of variation must be due to the colour of the pods, seed, hairiness of the pods and the possibility of a few biochemicals present in the pods and seeds.

Table 2. Correlation matrix of the relationship between grain damage by podfly and pod characters

Characters	X_1	X_2	X_3	X_4	X_5
Y Grain damage (%)	-0.09**	0.13**	-0.16**	0.08*	0.15**
X_1 Pod length (cm)	1.00	0.18	0.14	-0.02	0.00
X_2 Pod width (cm)		1.00	0.02	0.02	0.07
X_3 No. grain/pod			1.00	-0.14	-0.12
X_4 Grain length (mm)				1.00	0.97
X_5 Grain width (mm)					1.00

* Significant at 5% level
** Significant at 1% level
NS Not significant

Table 3. Multiple regression analysis of the grain damage by podfly and pod characters

Characters	Mean (x)	Multi. Reg. Coe. (b)	SE (b)	't'
X_1 Pod length (cm)	05.20	-0.20	0.18	-1.06 NS
X_2 Pod width (cm)	00.78	10.25	9.45	1.09 NS
X_3 Grains/pod (nos)	03.47	-05.27	3.22	-1.64
X_4 Grain length (mm)	05.01	-07.82	2.80	-2.79**
X_5 Grain width (mm)	04.41	06.30	2.08	3.03**

Constant term (a) = 47.30
Mean of dependant variable (Y) = 24.75
R^2 = 0.37*

* Significant at 5% level
** Significant at 1% level
NS Not significant

REFERENCES

DURAIRAJ,C. (1995). **Ecology and management of tur podfly *Melanagromyxa obtusa* Malloch.** In pigeonpea. *Ph.D. Thesis*, Tamil Nadu Agricultural University, Coimbatore, India,200 p.

ICRISAT. (1986).Annual Report for 1985. Patancheru, Andrapradesh, India, 379 p.

LAL,S.S. YADAVA, C. P. and SACHAN, J.N. (1993). Assessment of pod borer damage on pigeonpea in different agro ecological zones of Utter Pradesh. **India N. J. Pulses Resi., 5:** 174-178.

PIRAVIPERUMAL. A. (1979). **Studies on varietal resistance, biology and control of podfly *Melanagromyza obtusa* Malloch. in redgram.** M. Sc., (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore, India. 65 p.

THAKUR, B.S., RAWAT, R.R., VERMA, R. and MOITRA, A. (1990). Influence of shape and size of pods of pigeonpea on the susceptibility to the pod fly, *Melanagromyza obtusa* Malloch and the pod bug *Clavigralla gibbosa* **Spinola. Indian J.Ent., 51** : 159-162.

VEDA, O. P., PUROHIT, M.C. and SOOD, N.K. (1975). Varietal susceptibility of arhar to *Melanagromyza obtusa* Malloch *Exelastis atomosa* W. and *Heliothis armigera* **H.b,JNKVV. Res. J., 9:** 7-9.

(Received : September 1998 Revised : April 2000)

Madras Agric. J., 86(10-12): 596-599 October - December 1999

FOLIAR SPRAY OF FUNGICIDES AND THEIR EFFECT ON INCIDENCE OF DIE BACK DISEASE AND YIELD OF RED CHILLI

B.P. SIDHNATH SINGH, S.K. YADAV, SINHA AND K.L. OJHA

Department of Plant Pathology
Rajendra Agricultural University, Bihar,
Pusa, Samastipur – 848 125.

ABSTRACT

Eight fungicides were evaluated *in vivo* for their effectiveness to combat die-back disease of chilli incited by *Colletotrichum capsici* by prophylactic spray. All the fungicides were significantly superior over control in reducing the disease incidence but three sprays of Indofil M-45 (0.25%) was found superior over all the treatments which produced least incidence of die-back and yielded maximum. This treatment was followed by three sprays of Difolatan (0.25%) and Bavistin (0.05%).

KEY WORDS : *Capsicum annum*, Die-back, *Colletotrichum capsici*, Fungicides.