

Study on the Seasonal Incidence of Agromyzid Stem Fly *Ophiomyia phaseoli* Tryon (Diptera : Agromyzidae) in Blackgram*

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A trial was conducted with 12 monthly sowings from December, 1976 to November, 1977 with blackgram (CO 2) at Coimbatore to study the seasonal incidence of stem fly *Ophiomyia phaseoli* Tryon. The study revealed that the stem fly incidence was minimum in September, October and November sown crops and was maximum in March, July and August sown crops. The stem fly incidence on 45th day after sowing was positively correlated with total rainfall during the corresponding period and was not correlated with other weather factors.

Agromyzid stem fly *Ophiomyia phaseoli* Tryon is a serious pest of pulses in India. Severe damage on blackgram caused by this pest has been reported in Delhi and other pulse growing areas of Northern India (Anon., 1971). The incidence of stem fly was considerably higher during warmer months than winter months (Morgan, 1938 and Caldwell, 1939). In India blackgram is cultivated round the year. Hence a knowledge on the seasonal incidence of stem fly would be of much help to take up integrated control measure against the pest. With this view in mind, a study was conducted at the Tamil Nadu Agricultural University, Coimbatore, to find out the seasonal incidence of agromyzid stem fly in blackgram and relationship with weather factors.

MATERIAL AND METHODS

The variety chosen for the experiment was CO 2. The first sowing was taken

up in December, 1976 and then continued at monthly intervals till November 1977. The crop was raised in a randomised block design with three replications. The plot size was 4 m × 2.5 m and a spacing of 30 cm × 5 cm was adopted.

The stem fly incidence was recorded at fortnightly intervals commencing from 15th day after sowing till 60th day. The percentage of stem fly incidence was worked out by recording the total number of plants and the number of affected plants.

The weather parameters *viz.*, the maximum and minimum temperature, relative humidity and rainfall during the period of study were gathered from the Meteorological Observatory of the Tamil Nadu Agricultural University, Coimbatore. Correlation was also worked out to find degree of association between the weather factor (mean of 15 days

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TABLE I Seasonal Incidence of Stem Fly *O. phaseoli* (December—1976—November—1977)
(December — 1976—November — 1977)

Month of sowing	Percentage of stem fly incidence (Period - days after sowing)				Mean
	15	30	45	60	
December	4.96 (12.66)	5.82 (13.31)	7.48 (15.88)	22.2 (28.09)	10.12 (17.49)
January	0.00 (2.36)	1.94 (7.91)	62.50 (52.24)	94.22 (81.81)	39.67 (36.08)
February	0.00 (2.36)	3.61 (10.83)	6.65 (14.82)	33.31 (34.73)	10.89 (15.68)
March	0.35 (3.95)	5.89 (14.02)	99.86 (88.78)	100.00 (90.00)	51.52 (49.19)
April	2.12 (8.39)	1.61 (7.25)	39.09 (38.68)	51.68 (45.92)	23.63 (25.06)
May	0.25 (2.36)	8.57 (16.84)	8.56 (16.97)	21.19 (27.09)	9.64 (15.82)
June	0.05 (2.29)	2.55 (9.19)	29.54 (32.88)	80.59 (63.96)	28.18 (27.08)
July	4.19 (11.65)	5.24 (12.79)	100.00 (90.00)	100.00 (90.00)	52.36 (51.11)
August	1.01 (5.41)	14.34 (21.76)	100.00 (90.00)	100.00 (90.00)	53.84 (51.79)
September	0.00 (2.36)	0.00 (2.36)	7.01 (15.29)	8.37 (16.69)	3.85 (9.15)
October	0.00 (2.36)	1.68 (7.11)	6.48 (14.56)	8.00 (16.60)	4.04 (10.16)
November	0.00 (2.36)	1.36 (6.57)	4.44 (12.14)	9.35 (17.78)	3.79 (9.71)
Mean	1.08 (6.16)	4.38 (10.83)	39.30 (40.21)	52.41 (50.22)	

CD ($p = 0.05$) Between months 2.91

CD ($p = 0.05$) Between period of observation : 1.68

CD ($p = 0.05$) Interaction between months and period of observation 5.82

Figures in parentheses are arc sine percentage transformed values.

observation preceding the date of observation of stem fly incidence) and the incidence of stem fly as per the method of Panse and Sukhatme (1957).

RESULTS AND DISCUSSION

Significant differences in the mean percentage of incidence among the

months were observed (Table I). The percentage of incidence varied between 3.79 and 53.84. Minimum incidence was observed in September, October and November sown crops with 3.85 per cent, 4.04 per cent and 3.79 per cent incidence, respectively. Maximum percentage of incidence viz., 51.52,

52.36 and 53.84 was observed in March, July and August sown crops, respectively. Morgan (1938) and Caldwell (1939) noted severe infestation of the crop sown in the months of December, March, April and May and lighter incidence in the crops sown during May, June and October. Abul Nasr and Assem (1966) observed light infestation in early summer (February-March) sown crops and no correlation between the sowing date of late summer crop (between 15th July and 29th August) and level of infestation. Davis (1969) reported minimum activity of the flies between April and September which increases there after upto March. The results in the present study about minimum incidence was in agreement with earlier reports of Morgan (1938) and Caldwell (1939). However, the present investigation revealed that crops sown in March, July and August were severely

damaged. The observations regarding the maximum incidence was in agreement with the report of Indian workers, Singh and Beri (1973) and Singh and Ipe (1973).

The stage of the crop also had greater influence. Minimum incidence was observed on 15th day after sowing followed by 30th day, 45th day and 60th day. Ooi (1973) reported complete mortality of greengram plants within three weeks of planting. But in the present study the pest damage gradually increased from 15th day after sowing and maximum death of plants occurred on 60th day. The short life cycle of the stem fly (about 27 days) favours the gradual increase in population resulting in severe damage of the crop correspondingly.

Correlation studies (Table II) showed no significant relationship

TABLE II Relationship between weather factors and stem fly incidence

Weather Factors	15th day	30th day	45th day	60th day	Regres- sion equation.
	after sowing r' value	after sowing r' value	after sowing r' value	after sowing r' value	
Maximum Temperature	- 0.225	0.395	0.512 N.S	0.445	-
Minimum Temperature	- 0.453	0.261	0.496 N.S	0.553	-
Morning humidity	0.165	-0.508	-0.006 N.S	-0.259	-
Evening humidity	-0.248	-0.298	0.026 N.S	0.043	-
Rainfall (Total)	-0.274	-0.457	0.768**	-0.349	Y= 17+0.871x
	N.S	N.S		N.S.	

N.S. = Not significant

** = Significant at 1% level

between stem fly incidence on 15th, 30th and 60th day after sowing and various weather factors, viz., temperature, rainfall and relative humidity. However, the incidence on 45th day after sowing was positively correlated with total rainfall ($r = 0.768^{**}$). For other parameters there was no correlation. The study has shown that the severe damage to the crop could be averted by delaying the sowings.

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