

# Impact of Sowing Time on Linseed Budfly Infestation

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**Abstract:-** The rate of infestation of linseed budfly *Dasineura lini* Barnes on linseed crop has been studied in rabi season 2020. Four varieties namely Jawahar-23, R-552, LS-2 and local variety were selected for sowing at different time intervals. The infestation of budfly was at par in crop sowed on 1 October, 10 October, 20 October and 30 October and was significantly less than the crop sowed on 9 November and 19 November. The initiation of bud formation in crop sowed on 1, 10 and 20 October respectively was started before appearance of the pest, hence the crop was exposed to low density of the pest population and for a shorter period. In crop sowed on 30 October the initiation of bud formation coincide with appearance of the pest, while in the crop planted on 9 and 19 November bud formation started after the appearance of the pest and the crop exposed to high pest population throughout the susceptible stage of the crop.

**Keywords:-** Budfly, Infestation, Linseed, Sowing Time.

## I. INTRODUCTION

Linseed (*Linum usitatissimum* Linnaeus) is an important oilseed crop in India. It is grown in 2.02 million hectares in the country which occupies one fourth of the total world hectareage of the crop and ranks first in area, fourth in production and eighth in productivity. Among the rabi oilseed in India, linseed is only next to rapeseed and mustard and is considered as an important oilseed crop. The Madhya Pradesh, Uttar Pradesh, Maharashtra and Bihar contribute more than 85% of the national hectareage and production.

Flax seed may lower cholesterol level, especially in women. Initial studies suggest that flax seed taken in the diet may benefits individuals with certain type of breast and prostate cancer. Flax may also lessen the severity diabetes by stabilizing blood sugar level. The linseed contains unsaturated fatty acids mainly linolemic acid and has fast drying property. Therefore, it is used for the preparation of paints, varnish, soap, printing ink, patent leather and water proof fibres.

About 20 species of insect pests infest linseed in different stages of plant growth. Among these the linseed budfly *Desinura lini* Barnes (Diptera : Cecidomyiidae) is the most important limiting factor in the successful cultivation of linseed in central and northern India and is also the reason for the stagnation of productivity at low level.

Pal *et.al.* (1978) reported considerable decrease in yield of linseed with the delay in sowing from 3 November to 15 December. Mathur *et.al.* (1984) reported that the infestation of *Desineura lini* was minimum in crop sown in October and there after the damage increased significantly. The bud infestation was upto 76.9 percent when the crop was sown on 15 November. Maximum yield of 1156 kg/ha was obtained in 18 October sown crop as against 505 kg/ha in 15 November sown crop.

Dixit *et.al.* (1994) worked on assessment of flexibility of sowing time of linseed (*Linum usitatissimum*) varieties under double cropping system. Fontana *et. al.* (2003) studied on the comparision of two spring sowing dates for linseed (*L. usitatissimum*) cultivars and found valuable results. Verma *et.al.* (1993) also described the response of *L. usitatissimum* varieties to different dates of sowing. Jakhmola *et.al.* (1973) reported the effect of date of sowing and nitrogen levels on the infestation of linseed bud fly *Dasineura lini* Barnes. Ekka *et.al.*(2017) worked on seasonal infestation of linseed budfly. Verma *et.al.* (1983) studied the response of linseed variety to different dates of sowing. They described that the dates of sowing directly affected the infestation of linseed budfly and yield of linseed.

The cultural method of manipulating the date of soeing to avoid pest infestation is also an eco-friendly approach. With this view the relationship of time of sowing with bud fly infestation has been attempted.

## II. METHODOLOGY

To find out the effect of date of sowing on the infestation of the bud fly, an experiment was laid out during rabi 2019-20. The details of the experiment are as follows –

Table 1 – Showing experimental details on the effect of date of sowing of linseed on the bud fly infestation.

Date of Planting	Varieties Tested	Replications	Designs	Plot size
1 October	Jawahar-23	Three	Split plot	4.0x2.4m
10 October	R-552			
20 October	LS-2			
30 October	Local			
9 November				
19 November				

The total number of the healthy buds and capsules and buds damaged by the fly were recorded on 10 randomly selected plants and the percent infestation was computed.

The correlation between date of sowing (x) and percent buds infested by the fly (y) was worked out. For date of planting numerical values were taken for each date. For first date i.e. crop sown on 1 October, the numerical value was taken as 1, for second date sown on 10 October as 2 and so on. The value of r was worked out and correlation coefficient was determined. The linear relationship between date of sowing and percent bud infestation was worked out for mean percent values of varieties and for each variety separately. This was done to determine to most suitable date of sowing and the most suitable variety to avoid pest infestation.

### III. EXPERIMENTAL FINDINGS

The results reveal that there is no significant difference in infestation in crop sown in October, but the crop sown in November had significantly higher infestation than the crop sown in October. The crop sown later in November had higher infestation than the crop sown early in November.

There was a gradual increase in infestation of bud fly with the delay in date of sowing. The crop sowed early on 1 October received on an average only 9.1 percent bud infestation, however, it was at par with the infestation recorded in the crop sown on 15 and 30 October. The crop sown on 14 November was significantly more infested than the crop sown on earlier dates i.e., 15 and 30 October and on the other hand it was significantly less infested than the crop sown on 29 November, which received maximum 37.8 percent bud infestation.

Table 2 infestation of *Dasineura lini* Barnes in varieties sown on different dates-

Date of Planting	Percent buds infested in varieties				
	Jawahar-23	R-552	LS-2	Local	Mean
1 October	15.3 (23.02)	20.2 (26.66)	19.2 (25.93)	19.5 (26.04)	19.6 (25.41)
11 October	17.0 (24.09)	21.0 (27.20)	15.9 (26.81)	16.1 (23.57)	17.5 (25.42)
21 October	12.2 (20.33)	14.0 (21.92)	13.6 (23.05)	15.6 (23.14)	13.9 (22.11)
31 October	18.9 (25.44)	17.9 (25.00)	17.8 (24.96)	20.5 (26.82)	17.9 (25.56)
10 November	36.3 (36.91)	30.6 (33.21)	32.8 (34.63)	49.3 (44.57)	37.3 (37.30)
20 November	45.6 (42.48)	44.7 (41.93)	40.8 (39.63)	42.3 (40.44)	43.4 (41.12)
Mean	24.2 (28.71)	24.7 (29.32)	23.4 (39.63)	27.2 (30.76)	
S.Em.		C.D. at 5 Percent			
For date of planting		1.28			2.10
For varieties		1.04			N.S.
For interaction between		2.22			N.S.
		dates and varieties			

Transformed figures into angle in parentheses

The difference in the infestation between two dates of sowing at the same level of variety also showed similar results, except in JLS (J)-1, where the crop sown on 1 October was also significantly less infested than the crop sown on 15 and 30 October.

There was a positive correlation between date of sowing (X) and bud fly infestation (Y), the 'r' value being 0.88 for JLS (J)-1 and Jawahar-23, 0.86 for T-397, 0.82 for local and 0.88 for the mean value of the varieties. A linear relationship between date of planting (x) and % buds infestation (Y) was observed.

### IV. DISCUSSION

Manipulating of time of sowing to avoid pest attack, is highly useful in cultural control system designed to maintain key pests number below the economic threshold, while preserving insect natural enemies. It is manipulated so that the susceptible stage of the crop not in synchrony with the population build up of the harmful stage of the insect pests. This is also true in case of linseed where linseed bud fly is the key pest of the crop and the time of sowing influence the infestation of the pest to a great extent.

During present studies the infestation of the bud fly was at par in crop sowed on 1 October, 10 October, 20 October and 30 October and was significantly less than in crop sowed on 9 November and 19 November. During the crop season bud fly first appeared on 19 December, but the population of the fly build up only in the first week of February. The initiation of bud formation in crop sowed on 1, 10 and 20 October started before appearance of the pest. Hence, the crop was exposed to comparatively low density of the pest population for a shorter period of time. In the crop sowed on 30 November the initiation of bud formation was almost coincide with appearance of the pest and the crop was exposed to low density of pest population. While in the crop planted on 9 and 19 November bud infestation in the crop started after the appearance of the pest and the high population of the pest existed before the initiation of bud formation and the crop sown on these dates was exposed to pest throughout the susceptible stage of the crop. This lead to high bud formation in the crop sown late on 9 and 19 November. This was true in all the four varieties under study namely R-552, Jawahar-23, LS 2 and local, as there was a little variation in days to flower and duration of blooming period in these varieties was also at par Gupta (1955), Jakhmola *et.al.* (1973), Mathur *et.al.* (1984) and Singh *et.al.* (1985) also reported that early sown crop is less infested by linseed bud fly than late sown crop. The data reported by Singh *et.al.* (1985) also indicates less infestation in crop sown up to 30 October and then an abrupt increase in infestation was observed in November sown crops, as observed during present investigations. Contrary to the present findings Singh *et.al.* (1991) reported as high as 30.65 and 31.53 percent bud infestation in 10 October and 25 October sown crop as against 33.60 and 37.21 percent in 10 November and 25 November sown crop.

## V. CONCLUSION

The findings indicate that time of planting play an important role in the management of linseed bud fly. The crop should be planted as early as possible in October to avoid infestation of bud fly.

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## REFERENCES

- [1]. Dixit J.P., S.K. Chaurasia, P.V.A. Pillai and R.A. Khan 1994, Assessment of flexibility of sowing time of linseed varieties under double cropping system in Tawa Command. Ind. J. Agron., 39 :105-109
- [2]. Fontana F., Cremachi D., Vender C., Maestrini and Natarelli L. 2003, Comparison of two spring sowing dates for linseed (*L. usitatissimum*) cultivars. Rivista De Agronomia. 30 : 248-251.
- [3]. Gupta R.L. 1955 Linseed gall fly (*Dasineura lini* Barnes) and its control. Proc. 42<sup>nd</sup> Indian Sci. Congr. part III, pp. 294&381

- [4]. Jakhmola, S.S., Kaushik, U.K. and Kaushal, P.K. 1973. Note on the effect of date of sowing and nitrogen levels on the infestation of linseed bud fly. *Dasineura lini* Barnes (Diptera : Cecidomyiidae). Indian J. Agric. Sci. 43 (6) : 621-623.
- [5]. Mathur Y.K. Basant Singh, Ram Ajnor and Shrivastava J.P. 1984. Effect of date of sowing on the incidence of *Dasineura lini* Barnes (Diptera: Cecidomyiidae) and yield of linseed J. Oilseeds Res. 11.: 77-79.
- [6]. Pal S., Shrivastava J.L. and Pande N.D. 1978. Effect of different dates of sowing on the incidence of *Dasineura lini* Barnes Indian J. Ent. 40 (4): 433-35.
- [7]. Rajesh Kumar Ekka, R.S. Meena and M.A. Laichattiwari 2017. Seasonal incidence of linseed budfly *Dasineura lini* Barnes in linseed ecosystem. 12 : 1328-1331
- [8]. Singh B., Katiyal R.R. Malik Y.P. and Pande N.D. 1991. Influence of sowing dates and fertilizer levels on the infestation of linseed bud fly (*Dasineura lini* Barnes) under varied conditions. Indian J. Ent. 53 (2); 291-297.
- [9]. Singh O.P. Saxena A.K. and Jakhmola S.S. 1985. Effect of dates of sowing and linseed varieties on the incidence of bud fly, *Dasineura lini* Barnes and their yield Agric. Sci. Digest 5 (3) : 1571-159.
- [10]. Verma K.P. and Pathak R.K. 1993, Response of Linseed (*L. usitatissimum*) varieties to different dates of sowing. Agron., 38 : 60-63.