



INSECT PESTS OF CANOLA CROP (OTHER THAN APHID)

Saljoqi, A. U. R.¹, Sadur-Rehman², Naseer Hussain¹ and Shah Alam Khan¹

¹Department of Plant Protection, NWFP Agricultural University, Peshawar, Pakistan

²Cereal Crops Research Institute, Pirsabaq, Nowshera, NWFP, Pakistan

E-mail: drsaljoqi@yahoo.com

ABSTRACT

The insect on canola crop comprises of aphids, *Lipaphis erysimi* Kalt. (Aphididae: Homoptera), cabbage caterpillar, *Pieris brassicae* (Linn) (Pieridae: Lepidoptera) and leafminer, *Chromatomyia horticola* Goureau (Agromyzidae: Diptera) as major pests, while painted bug, *Bagrada cruciferarum* Kirk. (Pentatomidae: Hemiptera) and cabbage semilooper, *Plusia orichalcea* Fab. (Noctuidae: Lepidoptera) as minor pests, were recorded at the Agricultural Research Farm, NWFP Agricultural University, Peshawar.

Keywords: insect, pest, canola, rape, mustard.

INTRODUCTION

Edible oil is one of the most important food items in Pakistan. The increase in domestic production is very stagnant, while the increase in total requirement is very rapid. The production of edible oil is 70% less than its requirements. Around Rs. 40 billion is spent on its import (Anonymous, 1997).

The local production of oil comes from cotton (81%) rape and mustard (12%) and other (4%). Oil recovery from cotton is very low (12-13%). However, rape and mustard are not only established oilseed crop, but their recovery is also very high (30-38%), depending upon their varieties/cultivars (Rahim *et al.*, 1993). Rape and mustard are grown on about 300.6 thousands hectares and 34.8 thousand hectares of land in Pakistan and NWFP, respectively (Anonymous, 1996)

Canola is referred to as a rapeseed cultivar that contain less than 2% erucic acid in its oil and less than 30 micro mol/g of one or any combination of four known aliphatic glucosinolates in its defatted meal (Fereidon, 1990).

Different insect pests including aphids, armyworm, cabbage butterfly, loopers, whitefly, mustard sawfly, pea leafminer, painted bug, green bug, hairy caterpillar, diamond backmoth and cricket attack rape and mustard (Hashmi, 1994).

Keeping in view the above points, studies were carried out at Agricultural Research Farm, NWFP Agricultural University, Peshawar to survey the insect pests attacking canola crop in Peshawar.

MATERIALS AND METHODS

The experiment was conducted at Agricultural Research Farm, NWFP Agricultural University, Peshawar under field conditions. The experiment was initiated in September, 1998 in the field and continued up to April, 1999.

The experimental plot (46x18m²) was divided in 12 main plots each with 3 subplots. Seed rate was 3.75kg ha⁻¹. The row to row distance was 30cm. A number of 152 canola plants per subplots were maintained throughout the cropping season. Uniform cultural practices were adopted in all plots.

Canola insect pests

All the insects as mature (adult) or immature (nymphs/larvae and pupae) forms found on canola plants were collected from the time of germination till harvest of crop. The immature forms were reared up to adult stage. The adults in either case were killed, pinned, set and preserved in box for identification.

The population density of insects, attacking different cultivars of canola was recorded at weekly interval.

The population density of painted bug, cabbage caterpillar, cabbage semilooper and leafminer, three sites, each having an area of 1m² per treatment per replication was selected. An average number of insect m⁻² for all the pests (except aphids) on canola crop was calculated for comparison. The maximum number of all insect pests recorded during the season for a single observation was regarded as 100. From this all the data for each observation was changed in percentage. So that the ratio among insets can be prominently observable.

RESULTS

Insect pests of canola

Table-1 reveals that painted bug *Bagrada cruciferarum* Kirk. (Pentatomidae: Hemiptera); cabbage caterpillar, *Pieris brassicae* Linn. (Pieridae: Lepidoptera) cabbage semilooper, *Plusia orichalcea* Fab. (Noctuidae: Lepidoptera) and leafminer, *Chromatomyia horticola* Goureau (Agromyzidae: Diptera) as insect pests of canola were recorded from 14th December 1998 to 10th April 1999 at Agricultural Research Farm, NWFP Agricultural University Peshawar.

The density of all these insect pests was recorded from plants present in one square meter.

The total numbers of four pests was recorded throughout the season. The maximum total number (i.e. 8.51 per m²) of these four pests was regarded as 100. The remaining observations of all pests were transformed into percentage. In this way the density ratio of these four pests could be compared with one another. These converted densities are given in Table-2. The data presented in Table-2 indicates that density of all the four insect pests of



canola crop during the active season varied from 6.22 to 42.59%. The maximum numbers of pests were recorded on 22nd march 1999, with a seasonal average of 100% per square meter, with a seasonal average of 42.59%.

Table-1. Average seasonal infestation of insect pests (other than aphid) per sq. m. on canola crop at weekly interval during February to April 1999.

S. No.	Observation Date	Painted bug (1)	Cabbage caterpillar (2)	Cabbage semilooper (3)	Leafminer (4)	Total
1.	08-02-1999	0.00	0.72	0.01	0.00	0.73
2.	15-02-1999	0.00	0.51	0.02	0.00	0.53
3.	22-02-1999	0.02	1.77	0.00	1.5	3.29
4.	01-03-1999	0.03	0.91	0.00	1.88	2.82
5.	08-03-1999	0.05	1.16	0.00	1.90	3.11
6.	15-03-1999	0.00	2.74	0.00	2.01	4.75
7.	22-03-1999	0.02	6.39	0.00	2.10	8.51
8.	30-03-1999	0.00	4.43	0.00	2.15	6.58
9.	04-04-1999	0.00	1.42	0.00	2.19	3.61
10.	10-04-1999	0.00	0.11	0.00	2.21	2.32

1. *Bagrada cruciferarum* Kirk. (Pentatomidae: Hemiptera)
2. *Pieris brassicae* (Linn.) (Pieridae: Lepidoptera)
3. *Plusia orichalcea* Fab. (Noctuidae: Lepidoptera)
4. *Chromatomyia horticola* Goureaux (Agromyzidae: Diptera)

- In order to relate the maximum population (8.51) of four pests during season was taken as 100.

Table-2. Relative infestation (%age) of insect pests (other than aphid) per sq. m. on canola crop at weekly interval during February to April 1999.

S. No.	Observation date	Painted bug (1)	Cabbage caterpillar (2)	Cabbage semilooper (3)	Leafminer (4)	Total
1.	08-02-1999	0	8.46	0.11	0	8.57
2.	15-02-1999	0	5.99	0.23	0	6.22
3.	22-02-1999	0.23	20.79	0	17.62	38.66
4.	01-03-1999	0.35	10.69	0	22.09	33.13
5.	08-03-1999	0.58	13.63	0	22.32	36.54
6.	15-03-1999	0	32.19	0	23.61	55.81
7.	22-03-1999	0.23	75.08	0	24.67	100*
8.	30-03-1999	0	52.05	0	25.26	77.32
9.	04-04-1999	0	16.68	0	25.73	42.42
10.	10-04-1999	0	1.29	0	25.96	27.26
	Average	0.14	23.68	0.03	18.72	42.59

The detailed observation of each pest is presented as under:

Painted bug *Bagrada cruciferarum* Kirk

The data show that the pest appeared in 4th week of February and continued up to 4th week of March. The bug infestation (Table-2) gradually increased up to 8th march 1999 from these onward it started decreasing. The average population (%age) ranged from 0-0.58 with an average of 0.14% per sq. m.

Cabbage caterpillar, *Pieris brassicae* Linn

Table-2 shows that cabbage caterpillar was observed from 2nd week of February till 10th of April 1999.

Its population gradually increased up to 4th week of March, but started decreasing in population onward. The pest remained in the field up to 2nd week of April 1999.

The infestation of caterpillar indicates that percentage of caterpillars per square meter during the season was from 1.29 to 75.08 with an average of 23.68%.

Cabbage Semilooper, *Plusia orichalcea* Fab

The pest was observed only in 2nd and 3rd week of February. The percent infestation per square meter was low, ranging from 0.11 to 0.23 with total average of 0.03%.

**Leafminer, *Chromatomyia horticola* Goureau**

Leafminer attack was nil up to 1st fortnight of February. It appeared in the field in last week of February and continued up to 2nd week of April 1999.

The Table-2 shows that the lowest population percentage was 25.96 with total average of 18.72% per sq. m.

DISCUSSION

The insect pests of canola other than aphids were recorded from its time of germination till harvest. The percentage population per square meter recorded on different dates at weekly interval is given in Table-2. Some of them are major pests while others are minor ones.

Cabbage caterpillar and leafminer were found serious insect pests in Peshawar. These findings are somewhat similar to those of the other investigators. Anonymous (1993) observed *Phytomyza* and *P. brassicae* as serious pests. Semilooper and painted bug were also recorded as minor pests in the present study. Former pest is not comparable to the findings of Harvir *et al.* (1993). They recorded this as a major pest. The latter pest cannot be compared, as no literature of such a nature was available.

The results (Table-2) also reveal that painted bug appeared in 4th week of February and continued up to end of 3rd week of March. The bug infestation gradually increased up to 8th March 1999. From these onward it started decreasing. Its population varied from 0 to 0.58% with an average of 0.14% per square meter. These figures indicate it was a minor pest. The observation is dissimilar to Harvir *et al.* (1993) who observed it as major pest. This may be due to climatic conditions, cultivars or any other conditions prevailing to the areas.

Cabbage caterpillar infestation was observed from 2nd week of February till 10th of April (Table-1). Its population gradually increased up to 4th week of March. From there onward infestation went on decreasing. The population varied from 1.29 to 75.08 with an average of 23.68% per sq. m. The result for pest incidence is somewhat similar to that of Anonymous (1993), who reported that *P. Brassicae* was observed on mustard crop from 3rd week of February up to the end of March. He also reported that it was the peak period of infestation. The

little change in pest appearance period may be due to environmental conditions of both areas.

The result of cabbage semilooper was observed in the 2nd and 3rd week of February. It was a minor pest. Literature on the semilooper as pest is not available; hence the results of this insect can not be discussed.

The leafminer appeared in the field in last week of February and continued up to 2nd week of April 1999. The population varied from 17.62 to 25.96 with an average of 18.72% per sq. m. The present results agreed somewhat to that of Anonymous (1993) who observed *Phytomyza* sp. on mustard from 1st week of December but remained very low till 2nd week of March. The peak period of infestation was 2nd week of April.

REFERENCES

- Anonymous. 1993. Population dynamics of major insect pests of mustard. Annual progress report for year 1993-93. Agri. Res. Inst. Tarnab, Peshawar. p. 123.
- Anonymous. 1996. Agricultural Statistics of Pakistan, 1995-96. Ministry of Food, Agriculture and Livestock, Govt. of Pakistan. p. 293.
- Anonymous. 1997. Grow canola. Extension program for 1997-98 (one-page leaflet). Pakistan Oilseed Development Board, Agricultural Research Institute, Tarnab, Peshawar.
- Fereidoon, S. 1990. Canola and rapeseed. Production, chemistry nutrition and processing technology. Van Nostard Reinhold, New York: p. 355.
- Harvir, S., H.R.Rohilla, P. Ram, D.S. Ahlawat and H. Singh. 1993. Out break of painted bug on oilseeds brassicae in India. Intern. Journ. Tropical Agri., Vol. 11(2): 153-154.
- Hashmi, A. A. 1994. Insect Pest Management: Cereal and Cash Crops. National Agricultural Research Centre, PARC, Islamabad. P. 317.
- Rahim, M., Z. Swati and G. Hussain. 1993. Rape and mustard. Oilseed crop review, constraints and strategies, N.W.F.P. Agricultural University, Peshawar. pp. 1-9.