



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(2): 3195-3197

© 2018 JEZS

Received: 19-01-2018

Accepted: 20-02-2018

Adesh KumarKrishi Vigyan Kendra, Brari,
Jhansi, Uttar Pradesh, India**Abhijeet Srivastava**Krishi Vigyan Kendra, Brari,
Jhansi, Uttar Pradesh, India**Roomi Rawal**Chaudhary Charan Singh
Haryana Agricultural
University, Hisar, Haryana,
India**Nishi Roy**Krishi Vigyan Kendra, Brari,
Jhansi, Uttar Pradesh, India

Chemical evaluation against mustard aphid in Bhundelkhund region

Adesh Kumar, Abhijeet Srivastava, Roomi Rawal and Nishi Roy

Abstract

Jhansi district villages come under a Bhundelkhund region of Uttar Pradesh were surveyed during rabi season 2017-18 and mustard aphid manifestation was recorded. The maximum mean population 42 aphids/plant was observed in Lakara village and the second highest population was observed in two villages namely Birgua and Booda with 40 aphids/plant. Field experiment was carried out to evaluate the efficacy of four insecticides during 2017-18 at Krishi Vigyan Kendra, Bharari, Jhansi (U.P.). It was observed that Thiamethoxam (Actara) (T4) showed the lowest population with 2.60 aphids/ top 10 cm central twig at 4 days after spraying (DAS) and reduced 91.40% aphid population and also effective upto 8 days reduced 92.4% population. Profenofos 40%+ Cypermethrin 4% (Profex Super) (T2) also showed good result with 3.30 aphids/ top 10 cm central twig and it was reducing 89.2% and 90.10% aphid population after 4 and 8 days spraying (DAS) respectively. It was also observed that Chlorpyrifos 20 EC, (Topline) showed less effective as compared to other three chemical which reduced 83.5% aphid population on 4 days after spraying. Deltamethrin 1%+Trizophos 35% (Ammo) also reduced the aphid population on 4 days after spraying 85.80% and 86.7% after 8 days.

Keywords: Aphid, Actara, infestation and insecticides and mustard

1. Introduction

Rapeseed-mustard is a major oilseed crop grown in India. In the world this crop is growing 53 countries across the six continents, with India being the third largest producer after China and Canada. It contributes about 28.6% in the total oilseeds production in India, whereas it is the second most important edible oilseed after groundnut sharing 27.8% in India's oilseed economy. Indian mustard, *Brassica juncea* is predominantly cultivated in Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat [10]. The production and quality of mustard is hampered by various factors therefore production of rapeseed mustard is low in India as compared to other countries mainly due to damage caused by insect pest and diseases including other factors [1]. Mustard aphid *Lipaphis erysimi* (Kalt.) (Homoptera: Aphididae) is one of the most serious pest infect the crop from seedling stage to maturity. However, it is too harmful to crop at the reproductive phase which reduced yield 35.4 to 96% in favourable conditions and oil content upto 66.87% [11]. Besides these, aphids secrete honeydew, which promote the growth of the sooty moulds giving the stem and leaves black appearance and interfere the photosynthesis. The infestation of mustard aphid occurs in the field from December to February. Both nymph and adult suck the cell sap from various parts of plant like leaves, inflorescence, tender stem and pods and cause economic damage. Due to heavy infestation, the symptoms of yellowing, curling and then drying of leaves appear, resulting in development of feeble pods and small seeds in the pods. The aphids suck sap from leaves and in severe infestation, leaves become curled, plant fails to develop pods, the young pods when developed fail to become mature and cannot produce healthy seeds. Different insecticides have been tested and recommended by many workers like [2, 4, 7, 12]. However, in the present studies some insecticides have been evaluated along with the already recommended insecticides for the control of mustard aphid under Bhundelkhund (U.P.) region.

2. Materials and Methods

2.1 Survey of Mustard crop for *Lipaphis erysimi*

The present study was conducted to assess the infestation of *Lipaphis erysimi* in Jhansi district come under the Bhundelkhund region of Uttar Pradesh. Different mustard growing villages areas of the district were surveyed in the months of January and February during rabi seasons

Correspondence

Adesh KumarKrishi Vigyan Kendra, Brari,
Jhansi, Uttar Pradesh, India

2018. At each location, pest infestation was recorded by counting the number of aphid population/plants (top 10 cm central twig of plant).

2.2 Insecticides evaluation under field condition

The study was carried out in experimental field of Krishi Vigyan Kendra, Jhansi Bhundelkhand region of Uttar Pradesh during 2017-2018. The experiment was conducted in a randomized block design with 3 replications having plot size of 3 x 3m and spacing between row to row and plant to plant as 30cm and 10cm, respectively. The mustard cultivar RH-749 was used for this experiment. There were five treatments including untreated control. Four insecticides namely Deltamethrin 1%+Trizophos 35%, Profenofos 40%+Cypermethrin, Chlorpyrifos 20 EC and Thiamethoxam were evaluated to see their effectiveness against mustard aphid. Details of the treatments are given in Table 1. The test insecticides were applied as foliar spray with the help of knapsack sprayer. The spray of insecticides was given when the aphid population reached at ETL level [3] and whole plant was thoroughly covered by spray fluid. All the standard agronomic practices were followed to raise a good crop.

2.3 Observation

The observations of counts of aphid were recorded on 10 randomly selected plants per plot. On each plant, 10 cm top central twig were observed to record aphid. The data on

surviving aphid population was reported on the basis of mean aphid population per plant. Precount observation of aphid was recorded one day before spraying and subsequent post count data on 4 and 8 days after spraying (DAS).

Table 1: List of treatments

Treatments	Chemical Composition	Trade name	Used Dose/acre
T1	Deltamethrin 1%+Trizophos 35%	Ammo	250 ml
T2	Profenofos 40%+Cypermethrin 4%	Profex Super	250 ml
T3	Chlorpyrifos 20 EC	Dursban	600 ml
T4	Thiamethoxam,	Actara	40 gram
T5	Control		

3. Result and Discussion

The village wise surveys conducted during 2017-2018 *rabi* cropping seasons revealed that the aphid infestation was invariably present in all the villages (Table 2). A total of 13 villages were visited in Jhansi districts. It was observed that mean population of aphid less (30 aphids/plant) in the village Dudhva as compared to others villages. The maximum mean population 42 aphids/plant was observed in Lakara village which come under Badagaon block and second highest population was observed in two villages namely Birgua and Booda with 40 aphids/plant.

Table 2: Field based assessment of mustard aphid in mustard growing area in Jhansi district (U.P.) (2018).

S. No.	Village	Block	District	Mean Aphid population/ top 10 cm central twig of plant
1.	Lakara	Badagaon	jhansi	42
2.	Birgua	Badagaon	jhansi	40
3.	Ghandinagar	Badagaon	jhansi	35
4.	Keshavpur	Badagaon	jhansi	36
5.	Bhojla	Badagaon	jhansi	36
6.	Behta	Badagaon	jhansi	38
7.	Booda	Badagaon	jhansi	40
8.	Divyapur	Moth	jhansi	38
9.	Bamaur	Badagaon	jhansi	34
10	Aari	Badagaon	jhansi	32
11	Kot	Badagaon	jhansi	32
12	Dudhva	Badagaon	jhansi	30
13	Dhikauli	Babina	jhansi	38

All the tested insecticide treatments were show superior to untreated control in reducing aphid population. At 4 days after spraying (DAS) it was observed that Thiamethoxam (Actara) (T4) showed the lowest population with 2.60 aphids/ top 10 cm central twig as against 30.42 aphids/ top10 cm (central twig) in untreated control (Table 3) (Fig.1). That chemical reduced 91.40% aphid population on 4 days after spraying and also effective upto 8 days after spraying reduced 92.4% population. Profenofos 40%+ Cypermethrin 4% (Profex Super) (T2) also showed good result with with 3.30 aphids/

top 10 cm central twig as against 30.20 aphids/ top10 cm (central twig) in untreated control. Profenofos 40%+Cypermethrin 4% (Profex Super) was reducing 89.2% and 90.10% aphid population after 4 and 8 days spraying (DAS) respectively. It was also observed that Chlorpyrifos 20 EC, (Topline) showed less effective as compared to other three chemical which reduced 83.5% aphid population on 4 days after spraying. Deltamethrin 1%+Trizophos 35% (Ammo) also reduced the aphid population on 4 days after spraying 85.80% and 86.7% after 8 days (Table 3) (Fig.1).

Table 3: Efficacy of different insecticides on the population of aphid in mustard crop.

Treatments	Mean Aphid population/ top 10 cm central twig of plant		
	DBS	4 DAS	8 DAS
T1- Deltamethrin 1%+Trizophos 35%, Ammo*	32.42	4.6	4.3
T2- Profenofos 40%+ Cypermethrin 4%, Profex Super*	30.20	3.3	3
T3- Chlorpyrifos 20 EC, Topline*	32.21	5.3	4.6
T4- Thiamethoxam, Actara*	30.42	2.6	2.3
T5- Control	30.0	2.6	2.3

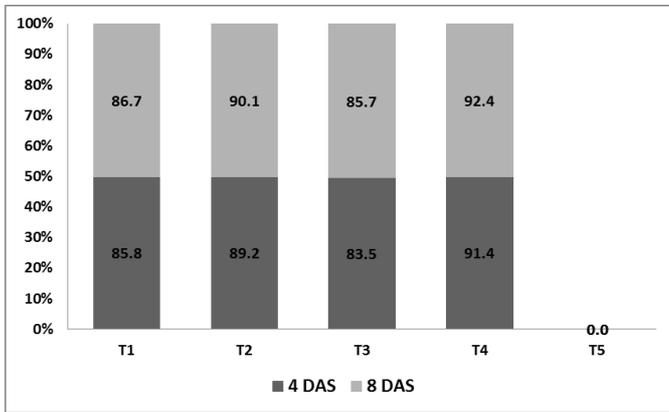


Fig 1: Reduction% of aphid population in mustard crop against different insecticides.

4. Discussion

In present study, it was observed that approximately all tested insecticides showed good results with respect to control aphid population in mustard crop. However, Thiamethoxam (Actara) and Profenofos 40%+ Cypermethrin 4% (Profex Super) showed higher effectiveness in suppressing mustard aphid as compared to other tested chemicals. The Chlorpyrifos 20 EC insecticide showed slightly lower effectiveness than Profenofos 40%+ Cypermethrin 4% (Profex Super), Thiamethoxam (Actara) and Profenofos 40%+ Cypermethrin 4% against aphids. Rajesh *et al.* [8] also observed maximum protection from mustard aphid and the highest yield by applying Thiamethoxam 25% WDG @100 g/ha. Similarly, Lal *et al.* [5] found that thiamethoxam was the most effective among five insecticides tested against *L. erysimi* on cabbage. The population reduction over control due to thiamethoxam was 72.88 per cent after one day of spray. Rohilla *et al.* [9] also evaluated the bio-efficacy of 10 insecticides against mustard aphid, *L. erysimi* among which imidacloprid 17.8 SL @ 0.0178 per cent, thiamethoxam (Actara) 25 WG @ 50 g a.i./ha, oxydemeton methyl 25 EC @ 0.025 per cent and monocrotophos 36 EC @ 0.036 per cent proved most effective. However, Mandal *et al.* [6] studied that Chlorpyrifos (93.50%) found to be most effective treatment followed by chlorpyrifos + cypermethrin (92.76%), thiamethoxam (90.70%) and imidacloprid (90.46%) and dichlorvos (82.81%) showed least effective.

5. Conclusion

Jhansi district villages come under Bhundelkhand region of Uttar Pradesh were surveyed during rabi season 2017-18 and maximum mean population 42 aphids/plant was observed in Lakara village and second highest population was observed in two villages namely Birgua and Booda with 40 aphids/plant. It was observed that Thiamethoxam (Actara) showed the lowest population with 2.60 aphids/ top 10 cm central twig at 4 days after spraying (DAS) and reduced 91.40% aphid population on 4 days after spraying and also effective upto 8 days reduced 92.4% population. Profenofos 40%+ Cypermethrin 4% (Profex Super) also showed good result it was reducing 89.2% and 90.10% aphid population after 4 and 8 days spraying (DAS) respectively.

6. Acknowledgement

The authors are grateful to the Head, Krishi Vigyan Kendra, Bharari Jhansi (U.P.), to provided help in farm management and chemical purchasing for research work.

7. References

- Bakhetia DRC, Sekhon BS. Insect pests and their management in rapeseed mustard. Journal of Oilseeds Research. 1989; 6:269-299.
- Bakhetia DRC, Sekhon BS, Brar KS, Ghorbandhi AW. Determination of economic threshold of *L. erysimi* on Indian Mustard. Journal of Aphidol. 1989; 3:125-134.
- Bath DS, Singh D. Studies on the economic threshold level of mustard aphid *Lipaphis erysimi* (Kaltenbach) on the radish seed crop in India. Tropical Pest management. 1989; 35(2):154-156.
- Choudhury S, Pal S. Efficacy of some newer insecticides against mustard aphid, *Lipaphis erysimi* Kalt. Shashpa. 2005; 12(2):125-126.
- Lal OP, Sinha SR, Srivastava YN. Evaluation of some promising insecticides against mustard aphid, *Lipaphis erysimi* Kalt. on cabbage under field condition. Journal of the Entomological Research. 2002; 26(2):169-173.
- Mandal D, Bhowmik P, Chatterjee ML. Evaluation of new and conventional insecticides for the management of mustard aphid, *Lipaphis erysimi* Kalt. (Homoptera: Aphididae) on rapeseed (*Brassica juncea* L.). The Journal of Plant Protection Sciences. 2012; 4(2):37-42.
- Misra HD. Evaluation of some synthetic insecticides and oils against mustard aphid, *Lipaphis erysimi* (Kaltenbach). Indian Journal of Entomology. 1993; 55(1):58-61.
- Rajesh KK, Sachan SK, Singh DV. Bio-efficacy of Some New Insecticides Against Mustard Aphid, *Lipaphis erysimi* (Kalt.) and Their Effect on Coccinellid Population in Rapeseed Mustard. International journal of plant research. 2013; 26(2):159-163.
- Rohilla HR, Bhatnagar P, Yadav PR. Chemical control of mustard aphid with newer and conventional insecticides. Indian Journal of Entomology. 2004; 66(1):30-32.
- Shekhawat K, Rathore SS, Premi OP, Kandpal BK, Chauhan JS. Advances in Agronomic Management of Indian Mustard [*Brassica juncea* (L.) Czernj. Cosson]: An Overview. International Journal of Agronomy, 2012, doi:10.1155/2012/408284.
- Singhvi SM, Verma ND, Yadava TP. Estimation of losses in rapeseed (*B. campestris* L. var. *toria*) and mustard (*B. juncea* Cross) due to mustard aphid (*L. erysimi*). Haryana Agricultural University Journal of Research. 1973; 3:5-7.
- Srivastava KM, Srivastava SK, Singh DR. Efficacy of selected insecticides against mustard aphid, *Lipaphis erysimi* (Kalt.) (Homoptera: Aphididae). Entomon. 1991; 16(3):241-244.