Research Paper :

Evaluation of Different Insecticidal Schedules Against Diamond Back Moth on Cabbage

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International Journal of Plant Protection, Vol. 2 No. 2 : 154-156 (October, 2009 to March, 2010)

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SUMMARY

The investigation was conducted on the farm of Entomology at College of Agriculture, Dapoli during 2004-2006. Ten treatment schedules were evaluated and replicated thrice. Each treatment comprised of total of 4 sprays. The studies revealed that, all the treatments were significantly superior over control. The insecticidal schedule (T_7) comprising of 0.035 per cent ducord followed by 0.07 per cent polytrin-c, 0.03 per cent dipel 8L and 0.5 per cent nimbicidine was found to be most effective for the control of DBM than rest of the insecticidal treatment schedules. The overall mean larval population of DBM in different insecticidal treatment schedules varied from 21.27 to 56.60 as against 91.80 in an untreated control.

Key words : *Plutella xylastella*, Ducord, Polytrin-c, Cabbage

The cabbage (*Brassica oleracea* var. *capitata* L.) is one of the popular and economically important cruciferous vegetable crops grown extensively all over the country, particularly in winter season. This vegetable contains vitamins A, B and C, minerals, proteins, carbohydrates and dietary fibres (Chalfield, 1954). The total area under vegetable crops in India is 62.48 lakh hectares with annual production of 939.21 lakh tonnes of vegetables and productivity of 14.92 t/ha (Anonymous, 2003). The cabbage crop is attacked by the number of pests which are active particularly during winter season. Among them, Diamond back moth, *Plutella xylostella* L. is important one, which occurs almost all over the world and causes severe damage to the crop and estimated 52 per cent losses in the marketable yield due to the attack of this pest (Krishnakumar *et al.,* 1986).

Several synthetic insecticides have been used for the control of DBM which have created problems like insecticidal resistance, environmental pollution and secondary pest outbreaks. Therefore, botanicals, biopesticides, organophosphates, synthetic pyrethroids and neonicotinoid groups of insecticides were evaluated to find out the suitable treatment which will cause least damage to the environment.

Accepted :
May, 2009

MATERIALS AND METHODS

The present investigation was carried out on Entomology Farm at College of Agriculture, Dapoli, Distt. Ratnagiri (M.S.) during the year 2004-2006. The experiment was carried out in Randomized Block Design with ten treatments and three replications. Details of treatments are given in Table 1. The first spraying was undertaken 15 days after transplanting and the further three sprays were given at an interval of 15 days thereafter. Pre-treatment observations were recorded 24 hours before spraying and post treatment observations were recorded on three leaves, each at top, middle and bottom on five randomly selected plants in each plot at 1st, 3rd, 5th, 10th and 15th days after each spraying. Data thus obtained were analysed statistically.

RESULTS AND DISCUSSION

It can be inferred from the data presented in Table 2 that, all the treatments were significantly superior over control. The data recorded on lowest overall mean larval population of DBM was 21.27 per 15 leaves per five plants of insecticidal treatment schedule (T_7) which was significantly lower than rest of the insecticidal treatment schedules. The overall mean larval population of DBM per 15 leaves/ five plants in different insecticidal treatment schedules varied from 21.27 to 56.60 as against

Table 1 : Treatment details

Treatment No.	Particulars
T_1	0.5 % Nimbicidine followed by 0.5 % Nimbicidine, 0.5 % Nimbicidine and 0.5 % Nimbicidine
T_2	0.07 % Polytrin C followed by 0.07 % ploytrin C, 0.07 % polytrin C and 0.07 % Polytrin C
T_3	0.035 % Ducord followed by 0.035 % Ducord, 0.035 % Ducord and 0.035 % Ducord
T_4	0.005 % Imidacloprid followed by 0.005 % Imidacloprid, 0.005 % Imidacloprid and 0.005 % Imidacloprid
T_5	0.03 % Dipel 8L followed by 0.03 % Dipel 8L, 0.03 % Dipel 8L and 0.03 % Dipel 8L
T_6	0.07 % Polytrin C followed by 0.005 % Imidacloprid, 0.03 % Dipel 8L and 0.5 % Nimbicidine
T_7	0.035 % Ducord followed by 0.07 % Polytrin C, 0.03 % Dipel 8L and 0.5 % Nimbicidine
T_8	0.005 % Imidacloprid followed by 0.07 % Polytrin C, 0.5 % Nimbicidine and 0.03 % Dipel 8L
T_9	0.5 % Nimbicidine followed by 0.5 % Nimbicidine, 0.03 % Dipel 8L and 0.03 % Dipel 8L
T_{10}	Control

Note : 0.07 % Polytrin C = Profenofos 40 % + Cypermethrin 4 %
0.035 % Ducord = Chlorpyriphos 15 % + Alphacypermethrin 1 %

Table 2 : Efficacy of different insecticidal schedules against diamond back moth, *P. xylostella* Linn.

Insecticidal treatment schedule	Mean larval population/ 15 leaves/ five plants						
	Days after spraying						
	Pretreatment count	Posttreatment count					Overall mean
		1	3	5	10	15	
T_1	51.70	45.01	42.10	40.02	46.03	48.20	44.83
	(7.26)	(6.78)	(6.56)	(6.40)	(6.85)	(7.01)	(6.77)
T_2	54.05	40.12	33.07	20.20	28.11	35.27	31.37
	(5.42)	(6.41)	(5.83)	(4.60)	(5.39)	(6.02)	(5.69)
T_3	50.69	41.21	28.30	21.10	25.19	29.22	29.91
	(7.19)	(6.49)	(5.41)	(4.70)	(5.11)	(5.49)	(5.56)
T_4	51.27	46.01	39.18	54.24	64.21	75.20	56.60
	(7.23)	(6.85)	(6.33)	(7.43)	(8.07)	(8.72)	(7.59)
T_5	50.26	34.10	20.20	14.0	22.17	30.20	24.30
	(7.16)	(5.92)	(4.60)	(3.87)	(4.81)	(5.58)	(5.02)
T_6	49.12	36.27	31.17	11.13	24.0	38.13	28.26
	(7.08)	(6.10)	(5.67)	(3.48)	(5.0)	(6.25)	(5.21)
T_7	41.90	36.57	13.16	19.20	22.12	26.17	21.27
	(6.55)	(6.13)	(3.76)	(4.49)	(4.80)	(5.21)	(4.72)
T_8	50.69	36.00	21.23	18.17	26.13	28.09	26.14
	(7.19)	(6.08)	(4.71)	(4.37)	(5.20)	(5.39)	(5.21)
T_9	55.25	42.31	31.21	24.19	29.22	35.07	32.52
	(7.50)	(6.58)	(5.67)	(5.01)	(5.49)	(6.00)	(5.79)
T_{10}	56.45	70.27	88.12	90.18	101.23	110.13	91.80
	(7.58)	(8.44)	(9.44)	(9.54)	(10.11)	(10.54)	(9.63)
S.E. $\pm$	0.21	0.25	0.29	0.12	0.10	0.20	0.10
C.D. (P=0.05)	N.S.	0.75	0.87	0.38	0.31	0.61	0.32

Figures in parentheses are $\sqrt{x + 1}$ values

91.80 in an untreated control.

The decreasing order of efficacy of different insecticidal treatment schedule was $(T_7) > (T_5) > (T_6) > (T_3) > (T_2) > (T_9) > (T_1) > (T_4)$.

The present findings confirmed those of Kulkarni *et al.* (1999) who reported that the bioinsecticides *viz.*, delfin 50 WG @ 0.5 kg/ha and Halt 5 WP @ kg/ha were found to be effective for reducing the DBM infestation at 3, 7 and 10 days after application and increased yield and quality of cabbage. The present investigation was in confirmity with the findings of Reddy *et al*. (1999) who reported that 0.10 per cent polytrin-c (profenophos 40 % + cypermethrin 4 %) was the best insecticidal treatment to reduce the DBM population. Gopalakrishnan (2001)

reported that all the Bt formulations *viz*., delfin, halt, dipel and biobit @ 1 kg/ha were effective to control the larval population of *P. xylostella* Linn.

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