Indian Journal of Applied Entomology **25**(2) : 136–138 (2011)

EVALUATION OF SPRAY SCHEDULES OF DIFFERENT INSECTICIDES AND BOTANICALS AGAINST PESTS OF CHILLI

B.G. PRAJAPATI AND A.V.AGALODIYA

Centre for Research on Seed Spices,Sardarkrushinagar Dantiwada Agricultural University, Jagudan, Dist.Mehsana,Gujarat,India; E–mail: bgprajapatiento@ yahoo.co.in

ABSTRACT

A field experiment on evaluation of spray schedules of different insecticides and botanicals against insect and mite pests of chilli (Gujarat Chilli–1) was undertaken during *kharif* 2009–10 at Centre for Research on Seed Spices, Jagudan in a randomized block design with five treatments and four replications. The spray schedule S_1 (comprising triazophos 40EC @ 25ml/10 lit., wettable sulphur 50WP @40g/10lit., imidacloprid 17.8SL@ 5ml/10lit., wettable sulphur 50WP @ 40g/10lit and acephate75SP@15g/10lit.of water) registered the lowest population of thrips at three (3.30/leaf) and seven (1.30/leaf) days after spray and, consequently, the lowest leaf curl intensity (2.42, 7.88 and 10.20 per cent at 50, 75 and 100 days after transplanting, respectively). The mean population of mites was also lowest in the spray schedule S_1 three (2.19/leaf) and seven days (0.62/leaf) after spray. The damage caused by chilli fruit borer, *H. armigera* was the least in the spray schedule S_1 (2.17%), with the highest fruit yield (2656 kg / ha) of green chilli.

Key words: Chilli, Thrips, Leaf curl, Mites, Chilli fruit borer, Insecticides, Botanicals

INTRODUCTION

Chilli (*Capsicum annuum* L.) is an important spice as well as vegetable crop grown all over the country with a great export potential besides huge domestic requirement. A number of limiting factors have been attributed for its low productivity in our country; among them, occurrence of viral disease as well as ravages caused by insect and mite pests are significant. The pest spectrum of chilli crop is complex with more than 293 insects and mite species causing damage to the crop in the field as well as in storage (Anon., 1987); among these, aphids (*Myzus persicae* Sulzer), thrips (*Scirtothrips dorsalis* Hood), yellow mite (*Polyphagotarsonemus latus* Banks) and chilli fruit borer (*Helicoverpa armigera* Hubner) are more vital production constraints. Information on suitable spray schedule to combat chilli pests is scanty in general, particularly from North Gujarat Agro–Climatic Zone; therefore, evaluation of spray schedules comprising insecticides and botanicals was taken up.

MATERIALS AND METHODS

A field experiment on evaluation of spray schedules of different insecticides and botanicals was undertaken during *kharif* 2009 at Centre for Research on Seed Spices, Sardarkrushinagar Dantiwada Agricultural University, Jagudan, Gujarat in a randomized block design with five treatments and four replications using the variety Gujarat Chilli–1. Each plot measured 3.60m x 6.00m; spacing between and within rows were maintained at 60cm and 60cm, respectively. All the recommended agronomical practices were adopted. The spray schedules consisted of the following: $\mathbf{S_1}$ – triazophos 40EC @ 25ml/10 lit., wettable sulphur 50WP @40g/10lit., imidacloprid 17.8SL@ 5ml/10lit., wettable sulphur 50WP @ 40g/10lit and acephate75SP@15g/10lit.of water; $\mathbf{S_2}$ – azadirachtin 0.0005%, Nikuchhi 1% and neem oil 0.5% + 0.1% soap solution; $\mathbf{S_3}$ – NSKS 5%, triazophos 40EC @ 25ml/10 lit., dicofol 18.5EC@ 15ml /10lit. and aceatamiprid 20SP @ 4g / 10lit. of water; $\mathbf{S_4}$ – Nikuchhi 1%, propergite 57EC @ 20ml/ 10 lit., neem oil 0.5% + 0.1% soap solution and wettable sulphur 50WP @ 40g in 10 lit. of water ; and schedule $\mathbf{S_5}$ was kept as untreated control. Foliar application of respective insecticides as well as botanicals was given as per schedule using a manually operated knapsack sprayer. First application was made at an economic threshold level of 1thrip/ leaf,whereas, subsequent sprays were conducted at an interval of 10 days.

Five plants were selected randomly from each plot and the population of thrips and mites were counted from three leaves (top, middle and bottom) of each selected plant one day prior to each spray and after 3 and 7 days of spray (DAS). Finally, mean population of thrips and mites per leaf was worked out at three and seven days after spray. Number of plants showing the symptoms of leaf curl disease per plot was also recorded at 50,75 and 100

Table 1. Pest incidence and fruit yield of chilli in different spray schedules

Spray Schedules	Thrips /leaf		Mites/leaf		Fruit borer damage (%)	Fruit Yield (kg/ha)
	3 DAS	7 DAS	3 DAS	7 DAS		
S_1	1.95*	1.34*	1.64*	1.06*	8.46**	2656
	(3.30)	(1.30)	(2.19)	(0.62)	(2.17)	
S_2	2.52	2.02	1.99	1.49	23.82	1971
	(5.85)	(3.58)	(3.46)	(1.72)	(16.31)	
S_3	2.47	1.84	1.92	1.27	19.06	2377
	(5.60)	(2.89)	(3.19)	(1.21)	(10.66)	
S_4	2.70	2.25	2.06	1.31	28.72	1904
	(6.79)	(4.54)	(3.74)	(1.22)	(23.09)	
S_5	2.84	2.77	2.18	1.99	34.56	1698
	(7.57)	(7.17)	(4.25)	(3.46)	(32.19)	
S. Em. ±	0.051	0.040	0.093	0.11	0.39	65
C.D.@ 5%	0.16	NS	0.28	0.34	1.20	199
C.V. %	4.09	3.95	15.64	15.35	3.38	11.21

* $\sqrt{X+0.5}$ transformed values **Arcsine transformation; Figures in parenthesis are retransformed values

days after transplanting of chilli and per cent leaf curl disease intensity was worked out. The data were subjected to statistical analysis with due transformation to arc sine values. Chilli fruit borer damage (%) was also worked out and fruit yield of green chilli from each net plot was recorded and analyzed.

RESULTS AND DISCUSSION

Thrips: Perusal of the results presented in Table 1 reveal that all the four spray schedules were significantly superior over untreated control in reducing the population of thrips (*S. dorsalis*) at three days after spray, but the schedules did not differ at seven days after spray. The spray schedule S_1 had registered significantly the lowest population of thrips at three (3.30/leaf) days after spray; whereas, the mean population of thrips ranged between 1.30 (S_1) to 7.17 (untreated control) per leaf at seven days after spray. Similar records were made by Rajashri *et al*. (1991).

Mites: Similarly, all the four spray schedules were significantly superior to untreated control in reducing the population of the mite (*P. latus*) at three and seven days after spray. **T**he lowest mean population of mites was recorded in the spray schedule S_1 at three (2.19/leaf) and seven days (0.62/leaf) after spray.

Fruit borer damage: The results (Table 1) on fruit infestation in chilli showed that the least damage caused by chilli fruit borer (*H. armigera*) was registered in the spray schedule S_1 (2.17%), followed by the spray schedule S_3 (10.66%); the untreated plots of chilli had the highest fruit borer damage (32.19%). Evaluating different synthetic insecticides as well as plant products against chilli fruit borer, Manisegaran *et al*. (1995) reported similar findings.

Fruit yield (Kg/ha): Mean yield of marketable chilli fruits differed significantly among the spray schedules (Table 1). The spray schedule S_1 recorded the highest fruit yield of green chilli (2656 kg/ha); whereas, the spray schedules S_3, S_2, S_4 and S_5 recorded fruit yields of 2377, 1971, 1904 and 1698 kg/ha, respectively.

Table 2. Per cent leaf curl disease intensity of chilli in different spray schedules

Spray Schedules	50 days after transplanting	75 days after transplanting	100 days after transplanting
S_1	9.01* (2.42)	16.14* (7.88)	18.63* (10.20)
S_2	20.96 (12.80)	26.51 (19.94)	26.52 (19.99)
S_3	12.65 (4.79)	19.01 (10.62)	21.21 (13.09)
S_4	15.88 (7.49)	22.64 (14.81)	26.38 (19.75)
S_5	22.82 (15.05)	29.25 (23.89)	34.12 (31.52)
S. Em. ±	0.67	0.42	0.88
C.D. at 5%	3.52	1.29	2.71
C.V.%	8.18	2.85	6.97

* Arcsine transformation Figures in parenthesis are retransformed percent values.

Leafcurl disease intensity: The results presented in Table 2 indicate all the four spray schedules to be significantly

superior over untreated control in reducing the leaf curl disease at 50, 75 and 100 days after transplanting. The spray schedule S_1 recorded the lowest leaf curl disease intensity being 2.42, 7.88 and 10.20 per cent at 50, 75 and 100 days after transplanting, respectively.

It could be inferred that the spray schedule S_1 (triazophos 40EC @ 25ml/10 lit., wettable sulphur 50WP @ 40g/10lit., imidacloprid 17.8SL @ 5ml/10lit., wettable sulphur 50WP @ 40g /10lit. and acephate 75SP @ 15g / 10lit. of water) was effective for the management of chilli pests.

REFERENCES

Anonymous, 1987. Asian Vegetable Research and Development Centre. *Progress Report,* pp.77–79.

Chandrasekharan, N. and Veeravel, R., 1998. Field evaluation of plant products against chilli thrips, *Scirtothrips dorsalis. Madras Agricultural Journal*, **85**: 123–124.

Manisegaran, S.,Mohamed Hanifa, A. and Gopalswamy, A., 1995. Efficacy of synthetic insecticides and plant products in controlling fruit borers of chilli. *Indian Journal of Agricultural Sciences*, **65**: 156–157.

Rajashri, M., Reddy, G.P.V., Krishnamurthy, M.M. and Devaprasad, V., 1991.Bio–efficacy of certain newer insecticides including neem products against chilli pest complex. *Indian Cocoa Arecanut and Spices Journal*, **15**: 342–345.