



EVALUATION OF SOME INSECTICIDES AGAINST MAJOR INSECT PESTS INFESTING SOYBEAN

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ABSTRACT

The efficacy of some insecticides against major insect–pests on soybean was evaluated in field conditions. The results showed that the minimum larval population of green semilooper (0.55) and girdle beetle infestation (12.49 per cent) was recorded in triazophos. It was closely followed by quinalphos and chlorpyrifos with 0.76 and 0.86 larvae/metre row length and 12.6 and 14.35 per cent infestation of green semilooper and girdle beetle, respectively. The highest seed yield (1718Kg/ha) and net return (Rs. 5865) were recorded with quinalphos followed by triazophos (Rs. 4936) whereas, maximum ICBR (7.26) was obtained in chlorpyrifos followed by triazophos (7.25).

Key words: insect–pests, efficacy, Green semilooper, Girdle beetle and soybean

About 30 species of insect–pests have been observed on soybean in Humid South Eastern Plain zone of Rajasthan, the predominant species are Green semilooper, *Chrysodeixis acuta* Walker and Girdle beetle, *Obereopsis brevis* Swed, Green semilooper, *Chrysodeixis acuta* Walker damage leaves and flower and caused considerable yield loss. Similarly, Girdle beetle, *Obereopsis brevis* Swed makes tunnel in the petiole and stem of plant resulted in huge loss of soybean yield, if proper and timely control measures are not followed. The damage caused by individual insect is well documented (Anonymous, 1996 and Thakur, 1985). The use of insecticides is only the effective control measure to manage them. Hence, the present investigation was carried out to evaluate the efficacy, effect on seed yield and economic feasibility of some insecticides against major insect–pests infesting soybean crop.

MATERIALS AND METHODS

The field experiments were conducted during *kharif* 2000 and 2001 at Agricultural Research Station, Umedganj, Kota. The experiment was conducted in randomized block design with four replications. The plot size was 2.1m × 5.0m in which seven rows of soybean variety “JS–335” was sown, following all packages of practices for crop. The treatments were applied at 15 days interval commencing from vegetative stage of the crop and continued upto pod formation stage. First insecticidal application was given at 30–35 days after sowing. Second application was followed after two weeks of first application. Insecticides were sprayed with knapsack hand sprayer. The larval counts of semilooper were done in

random sample of one metre row length by using vertical beat sampling technique after 7 day of second spray when its population was maximum. While girdle beetle infestation recorded from one metre row length ear marked area by counting total as well as infested plants then per cent infestation was worked out and transformed into angular value. Three such observations were taken/plot in each. Seed yield at harvesting was recorded for each treatment separately.

Net return in term of Rs/ha and Incremental Cost Benefit Ratio was also worked out by comparison of the cost of protective sprays and net gain over the control.

RESULTS AND DISCUSSION

The data presented in Table 1 revealed that the larval population of green semilooper, *C. acuta* varied from 0.55 to 3.55 per metre row length in different treatments and all the treatments were significantly superior over control in reducing the pest population. The minimum larval counts were observed in application of triazophos (0.55 mrl) followed by ethofenprox (0.65 mrl), quinalphos (0.76 mrl) and chlorpyrifos (0.86 mrl), respectively. However, all the tested insecticides were statistically at par to each other.

The girdle beetle infestation ranged between 12.49 to 22.16 per cent among various treatments and all the treatments were found significantly superior over control. However, application of triazophos (12.49 per cent) showed comparatively less infestation than other treatments but it was statistically at par with quinalphos (12.6 per cent),

Table 1. Effect of different insecticides on insect pests and seed yield of Soybean

S. No.	Treatment	Does/ha	Green Semilooper (mrl)			Girdle beetle (% infestation)*			Seed yield (q/ha)		
			2000	2001	Pooled	2000	2001	Pooled	2000	2001	Pooled
1.	Carbosulfan 25 EC	800 ml	0.58	1.67	1.17	14.60 (6.35)	29.18 (23.8)	17.96 (9.5)	1423	1478	1455
2.	Cartaphydrochloride 50 SP	1.0 kg	0.50	1.41	1.00	14.95 (6.65)	26.93 (20.5)	16.98 (8.5)	1312	1426	1374
3.	Ethofenprox 10 EC	1.0 litre	0.33	0.75	0.65	14.48 (6.25)	23.20 (15.5)	14.92 (6.6)	1518	1624	1576
4.	Chlorpyriphos 20 EC	1.5 litre	0.91	0.83	0.86	14.70 (6.42)	21.87 (13.9)	14.35 (6.15)	1378	1613	1495
5.	Quinalphos 25 EC	1.5 litre	0.66	0.83	0.76	13.40 (5.40)	19.42 (11.10)	12.60 (4.8)	1823	1613	1718
6.	Triazophos 40 EC	800 ml	0.50	0.58	0.55	14.42 (6.20)	18.40 (10.00)	12.49 (4.7)	1490	1645	1577
7.	Control	–	4.08	2.91	3.55	14.43 (8.0)	35.92 (34.4)	22.16 (14.2)	845	895	875
	SEM±		0.11	0.095	0.37	0.32	0.88	0.75	169	046	069
	CD P (0.05)		0.31	0.28	1.28	0.94	2.63	2.44	521	135	241

* Angular transformed values; Figures are parentheses are re-transformed values.

Table 2. Economics and incremental cost benefit ratio of different treatments in soybean

Treatment	Pooled seed yield (q/ha)	Additional yield over control (q/ha)	Additional gross return over control (Rs/ha)	Cost of insecticides (Rs/ha)	Net Return (Rs./ha)	ICBR
Carbosulfan	14.55	5.80	4640	864	3776	4.37
Cartaphydrochloride	13.74	4.99	3992	1300	2692	2.07
Ethofenprox	15.76	7.01	5608	1500	4108	2.73
Chlorpyriphos	14.95	6.20	4960	600	4360	7.26
Quinalpho	17.18	8.43	6744	879	5865	6.67
Triazophos	15.77	7.02	5616	680	4936	7.25
Control	–	–	–	–	–	–

Soybean = Rs. 800/q, Carbosulfan = Rs. 540/litre, Cartaphydrochloride = Rs. 650/kg, Ethofenprox Rs. 750/lit, Chlorpyriphos Rs. 200/litre, Quinalphos = Rs. 293/lit and Triazophos = Rs. 425/lit

chlorpyriphos (14.35 per cent) and ethofenprox (14.92 per cent) respectively. The seed yield of soybean varied from 875 to 1718 Kg/hectare among different treatments. Among the treatments, quinalphos had highest seed yield (1718 kg) however, it was statistically at par with triazophos (1577 kg), ethofenprox (1576 kg) and chlorpyriphos (1495 kg).

The maximum net return Rs. 5865/ha was obtained with quinalphos whereas, highest ICBR (7.26) was observed in application of chlorpyriphos (Table–2). The effectiveness and economics of triazophos, quinalphos and chlorpyriphos against major pest *viz*; green semilooper, *Chrysodeixis acuta* walk and Girdle beetle

beetle, *Obereopsis brevis*, Swed. Infesting soybean have also been reported by Sharma (1999) and Chaudhary and Bajpai (2007). Kumar and Sri Ram (2002) also observed comparative higher yield of soybean with spray of chemical insecticides.

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