



Efficacy of Newer Insecticides as Seed Dressers on Sucking Pests of Cowpea

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Abstract – Seed treatment with Thiamethoxam @ 4.3 g and 8.6 g/kg, Imidacloprid @ 5ml and 10 ml /kg, Acetamiprid @ 15 g and 30 g/kg, Carbosulfan @ 30ml and 40 ml/kg, Clothionidon @ 6 g and 12 g/kg seed and Untreated control as 11 treatments replicated thrice in R.B.D were field evaluated for their efficacy against sucking pests of Cowpea, Var. CO-1 at SV Agricultural College, Tirupathi during Rabi season 2008.

To assess the influence of seed dressing chemicals in the suppression of early season insect pests in green gram. Thiamethoxam @ 4.3 g/kg and 8.6 g/kg was highly effective against aphids, thrips, leaf hoppers upto 30 days after germination in Cowpea. The pod damage was less in the plots treated with Thiamethoxam @ 8.6 g/kg, Imidacloprid @ 10 ml/kg and Acetamiprid @ 30 g/kg seed dressing chemicals in crop. The seed treatment can also be included as a component in the eco-friendly modules of integrated pest management in cowpea.

Keywords – Thiamethoxam, Imidacloprid, Acetamiprid, Carbosulfan, Clothionidon, Seed Treatment Efficacy.

I. INTRODUCTION

Cowpea commonly known as 'Lobia' is used as a pulse, a fodder and a green manure crop. Being rich in protein and containing many other nutrients it is known as vegetable meat. It is also a rich source of calcium and iron.

The crop gives such a heavy vegetative growth and covers the ground so well that it checks the soil erosion in problem area and can later be ploughed as green manure.

The problem of insect pests such as aphids, thrips, whiteflies, pod borers, pod bugs and other insect pests complex have also become quite serious in both the short duration crop cowpea. To manage these insects soil application of hazardous granular insecticides and sprayable chemical formulations are commonly used. As these insecticides contaminate the environment, alternatives are sought on priority. In this context, seed dressing chemicals are considered as better alternatives to protect these one test crop against the major insect pests.

II. MATERIALS AND METHODS

The efficacy of the certain insecticides as seed dressings was assessed in the present study. The field trails were designed with 11 treatments replicated three times in RBD involving five insecticides and their influence on the insect pest complex on Cowpea variety CO-1.

Appropriate dosages of Thiamethoxam @ 4.3 g and 8.6 g/kg, Imidacloprid @ 5ml and 10 ml /kg, Acetamiprid @ 15 g and 30 g/kg, Carbosulfan @ 30ml and 40 ml/kg, Clothionidon @ 6 g and 12 g/kg seed were weighed separately and mixed thoroughly with the polymer sticker provided. One kilogram of the seed from each of green

gram is taken in separate polythene bags and chemicals were added and thoroughly mixed until all the seeds were uniformly coated. Similarly, pre-measured quantities of Carbosulfan (30.0 ml and 40.0 ml) and Clothionidon (6.0 g and 12.0 g) were taken separately and applied on to the seed (1 kg of each crop) and carefully swirled swirled in separate polythene bags till all the seeds are coated with respective insecticide doses. All the seed dressings were done one day prior to sowing and shade dried.

Observations were recorded on the total number of aphids, jassids and thrips per ten randomly selected plants at 10,20,30,45 DAG. Also observations on grain yield were recorded after systematic harvesting. Data of each observations were subjected to statistical analysis.

III. RESULTS AND DISCUSSION

Effect of Seed Dressers on Sucking Pests (Table 1)

Aphids: The aphids populations at 10,20,30, and 45 DAG in the seed treatments with Thiamethoxam (4.3 g and 8.6 g/kg) and Imidacloprid (5 ml and 10 ml/kg) recorded significantly less populations, while untreated control had recorded significantly high populations. (24.00-191.33/10 plants). According to Kundu and Trimohan (1989), seed dressing/ pelleting with Carbosulfan @ 10 g/kg seed for the control of early sucking pests of soybean was more effective. NARP (1982) and Venkata Reddy (1998) noticed that chlorophyriphos and carbofuran seed treatments were effective against jassids in groundnut. Mote et al., (1994) and Sreelatha and Divakar (1977) also reported that the seed treatment with Imidacloprid @ 15 g/kg was promising against sucking pests such as Aphids, Jassids, Thrips, Mites and Whitefly in okra. Gupta et al. (1998) Jyothirmai (2000) achieved effective suppression of leaf hoppers in ground nut crop, through seed dressing with Imidacloprid. Similar observations were noticed by Sunanda and Dethe (1998) who reported seed treatment with Imidacloprid 700 FS at 15g/kg seed was very effective in keeping chillie seedlings from sucking pests viz., aphids, thrips and mites. Imidacloprid 0.035 per cent seed treatment followed by 0.08 per cent foliar spray at 15 and 30 days after sowing gave the most effective control of Thrips palmi on mung bean as reported by Sreekanth (2002).

Thrips: The influence of seed dressing insecticides on thrips revealed that the thrips population at 10,20,30 and 45 DAG in the seed treatments with Thiamethoxam and Imidacloprid was very less while untreated control had significantly high populations and varied significantly (12.66-114.00/10 plants). The present findings in conformity with the observations of Vadodaria et al. (2001) who reported that Thiamethoxam (Cruiser 70 WS)



@ 4.3 g/ and 2.8 g/kg, Imidacloprid (Gaucho 600 Fs) @ 12 ml and 9 ml /kg and Imidacloprid (Gaucho 70 WS) @ 7.5 g/kg kept the population of aphids, leaf hoppers, thrips below ETL.

Leafhoppers: The seed treatments with Thiamethoxam (4.3 and 8.6 g/kg) and Imidacloprid (5ml and 10 ml/kg) registered less populations of leafhoppers at 10,20,30 and 45 DAG while untreated control recorded significantly high populations (106.00/ 10 plants). Kumar et al. (2001) also observed that seed treatment with Imidacloprid and Thiamethoxam @ 12 ml / kg of seed gave good results in controlling the leaf hopper (Amrascabiguttula) in cotton. *Effect on Yield* (Table 2)

The highest yield in cowpea was recorded in the plots treated with Imidacloprid @ 5 ml / kg (16.51 q/ha) followed by Acetamiprid @ 15 g / kg (16.36 q/ha) and low yield was recorded in Clothionidon @ 12 g/kg (12.26 tqha) treated plots.

From the above one indication on yield of economic produce, it is understood that increased yields in the treatments were directly related to the plant stand. Similar findings were reported by Lal et al. (1974) who obtained increased yields of 46.43, 68.43 and 71.93 per cent, respectively over control with carbofuran treated groundnut seed @ 3,5 and 7 per cent levels. Seed treatment with quinalphos 25 % EC @ 25 ml/kg seed, gave highest pod yield (10.80 q/ha) and dry toddler (42.130 t/ha). Mote and Shah (1993) also obtained high grain yield with soil application of carbofuran 3G @ 1 kg/ha followed by the Carbosulfan 7% seed treatment in French bean. According to Patil and Kulkarni (2004), seed treatment with Thiamethoxam resulted in 742.50 kg/ha additional yield over untreated check. Mote et al. (1994) also reported that seed treatment of chillies with Imidacloprid at 10 g/kg + seedling root dip in 0.04 % resulted in the highest yield of dry chillies as compared to untreated check.

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Table 1. Effect of different treatments on the population of sucking pests

Tr. No.	Treatments	Mean number of sucking pests /10 plants											
		Aphids				Thrips				Leaf hoppers			
		10	20	30	45	10	20	30	45	10	20	30	45
T1	Thimethoxam@4.3g/kg	32.00	57.66	65.00	86.33	36.00	26.33	34.00	46.00	12.00	17.33	26.66	49.33
T2	Thimethoxam@8.6g/kg	24.00	64.33	57.66	75.33	29.00	19.66	26.00	39.33	9.33	13.66	20.66	41.33
T3	Imidaclopride@5 ml/kg	52.33	45.00	87.66	96.00	16.33	36.00	54.00	57.66	30.66	35.33	42.00	32.66
T4	Imidaclopride@10 ml/kg	44.00	35.33	72.66	107.33	12.66	42.66	47.66	64.00	22.33	27.66	36.00	25.00
T5	Acetamiprid@15 g/kg	70.33	70.66	105.00	172.00	47.66	83.33	68.66	79.00	71.00	50.00	58.33	65.00
T6	Acetamiprid @30 ml /kg	64.66	76.66	91.33	162.00	41.66	76.33	62.33	71.33	63.66	37.66	47.33	60.00
T7	Carbosulfan @30 ml /kg	95.33	96.66	122.66	145.00	66.00	66.00	83.33	105.00	56.00	65.66	86.33	79.00
T8	Carbosulfan @40 ml /kg	90.00	89.33	112.00	137.33	54.00	73.00	76.00	95.33	49.33	56.00	76.00	71.33
T9	Clothionidon@ 6 g/kg	83.66	105.00	142.00	128.33	76.00	61.00	86.00	94.00	43.00	76.33	72.66	89.33
T10	Clothionidon @12 g /kg	77.33	98.66	135.66	119.33	69.33	51.33	92.66	86.00	32.00	67.33	62.66	82.00
T11	untreated control	106.33	113.00	167.00	191.33	86.33	96.00	102.66	114.00	76.33	86.00	96.66	106.00
	General mean	67.27	77.48	105.33	129.18	48.63	57.42	66.66	77.42	48.45	56.87	63.72	77.42
	S.Em++	0.09	0.06	0.05	0.04	0.07	0.08	0.06	0.06	0.01	0.08	0.06	0.05
	CD 5%	0.29	0.20	0.15	0.14	0.20	0.24	0.20	0.19	0.29	0.23	0.17	0.16
	CV %	2.12	1.38	0.91	0.74	1.81	1.95	1.47	1.32	2.77	2.07	1.41	1.26



Table 2. Grain yield

Tr.No	Treatments	Green gram (Q/ha)
T1	Thimethoxam@4.3g/kg	15.66
T2	Thimethoxam@8.6g/kg	15.43
T3	Imidaclopride@5 ml/kg	16.51
T4	Imidaclopride@10 ml/kg	14.50
T5	Acetamiprid@15 g/kg	16.36
T6	Acetamiprid @30 ml /kg	15.74
T7	Carbosulfan @30 ml /kg	15.33
T8	Carbosulfan @40 ml /kg	12.71
T9	Clothionidon@ 6 g/kg	12.34
T10	Clothionidon @12 g /kg	12.26
T11	untreated control	12.70
	General mean	14.53
	S.Em+-	1.61
	CD 5%	NS
	CV %	19.28