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Efficacy of Different Acaricides Against Acid Lime Mite *Schizotetranychus baltazari* Rimando, Predatory Mite and Grading of Fruits

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Abstract: A study on efficacy of synthetic acaricides and biorationals against acid lime mite *Schizotetranychus baltazari* rimando, its predatory mite and grading of fruits has been carried out. that the results obtained show that spiromesifen 240 SC, difenthiuron 50 SC and hexythiazox 5.45ECwere highly effective for decreasing the number of mites followed by abamectin 1.9EC, propargite 57% EC and fenpyroximate 5 SC. Highest net profit was recorded from spiromesifen 240 SC, difenthiuron 50 SC and hexythiazox 5.45ECwith 331860, 328928 and 323105 rupees per ha per year respectively. *Hirsutella thomsonii, Verticellium leccanii* and neemark sprayed treatment showed higher number of predatory mites after 15 days from the second spray (3.06, 2.82 and 2.20 mites, respectively) and minimum number were recorded in spiromecifen 240 SC (0.05/ leaf), hexythiazox 5.45 EC (0.19/ leaf). The lowest numbers of grade III fruits were recorded in difenthiuron 50 SC and spiromesifen 240 SC of 20.66, 24.00 respectively. Whereas highest numbers of grade III fruits were noticed in untreated control (128) and *V. lecanii* (121.33) followed by *H. thompsonii* (113.33), neeemark (105.00), sulphur 80 WP (84.66), dicofol 18.5 EC (79.00) and ethion 50 EC (77.66).

Key words: Acid lime mite · Management · Predatory mite · Grading of fruits

INTRODUCTION

Citrus is a general term, which refers to a large number of species of fruit trees in the family Rutaceae. It includes grapefruit, lime, lemon, malta, orange and pomelo. Acid lime, *Citrus aurantifolia* (Swingle) is locally grown species for in routine life. Citrus fruits are rich in vitamin C as well as mineral salts and are consumed as dessert, squashes, marmalades, pickles and jellies. They are also used in the preparation of a large number of concentrated products like citric acid and pectin etc.

Citrus ranks third (next to mango and banana) in acreage among the fruits grown in India ranks sixth among the citrus growing countries of the world [5]. In India, citrus orchards occupy an area of 9, 87,000 hectares with an annual production of 96,38,000 million tones of fruits with an average productivity of 9.8 tones/ha (www://nhb.gov.in/area-pro/database-2011). Among 12 districts of Northern Karnataka, Bijapur and Gulbarga have the maximum area under acid lime cultivation i.e. 6,211 and 1,453 ha with the production of 1, 55,275 and 33,522 tonnes, respectively. More than 30% of citrus production in the country is lost every year as a result of damage caused by insect and mite pests [1&2]. Citrus is attacked by number of insect pests throughout its growth period starting from nursery to maturity of fruits. More than 250 insect species have been reported on various citrus species in India [5]. Among them Mites (carina*:* Arachnida*)* are one of the important pests of citrus causing severe damage in recent years. [7] reported that mite infestation on acid lime was 10-12 per cent in 2008-09 and which increased up to 14-18 per cent in 2009-2010 in Bijapur district. Hence, the present study was undertaken to know the mite, *Schizotetranychus baltazari* Rimando infestation in acid lime at Bijapur.

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MATERIALS AND METHODS

A field experiment was laid out in a farmer field (sick garden) at Tadavalaga during 2012-13 with inclusive of 14 treatments including acaricides, one botanical and two entomopathogenic fungi along with untreated control on acid lime cv. Kagzi lime. All treatments were replicated three times having four plants in each treatment including untreated control. The counts were done one day before spraying. Observation was recorded randomly from 20 leaves covering top, middle and bottom portion of tree. Observations were recorded on number of mites and predators/leaf at 3,7,and 15 days after spray. The treatments were imposed two times, first spray was made on 10/11/2013 and second spray was followed at 45 days interval after first spray.

For grading of marketable produce 50 fruit were taken from one plant and were graded based on size as, Grade I (>4.5cm dia), Grade II (3.5-4.5cm dia) and Grade III (< 3.5cm dia). At harvest, the fruits yield from individual plots was recorded separately and total yield was computed to tonnes per hectare. The details of experimentation on the management of mites on acid lime are summarized in Rabi season with design RBD and treatments 14 (4 plants / treatment) along with three replications.

RESULT AND DISCUSSION

In the present study,, the population of mites among the different treatments was uniform with respect to one day before spray. After the application of chemicals, all the treatments were effective in reducing the population of mites except neemark, *Verticillium lecani* and *Hirsutella thompsonii.* However, the lowest population of mites was recorded in spiromesifen 240 SC which was significantly superior over all the treatment followed by difenthiuron 50 SC, hexythiazox 5.45 EC, abamectin 1.9 EC, fenpyroximate 5 SC and propargite 57% EC. Fenazaquin 10% EC was slightly effective as compared to effective chemicals in reducing mites population. Similar trend was noticed in all treatments in reducing the mites population after seven and fifteen days of first spray.

Day before second spray, there was no significant difference among the treatment. The number of mite per leaf after three, seven and fifteen days of second spray exhibited significant variation among the different treatments. Three day after second spray significant lower mites population were recorded in, hexythiazox 5.45 EC which was on par with propergite 57 EC, spiromesifen 240 SC, difenthiuron 50 SC. However, maximum numbers of mites were recorded in *V. lecanii* and *H. thompsonii* (Table 1).

Seven days after spray, spiromesifen 240 SC was significantly superior in suppressing mites population. The next best treatment was hexythiazox 5.45 EC and which was followed by propergite 57 EC, difenthiuron 50 SC and abamectin 1.9 EC.

Fifteen DAS spiromecifen 240 SC recorded zero population of mite and similar trend was noticed in the remaining treatments in suppressing mite population as in case of three and seven days after spraying. Present investigation closely related to……..[4] whoreported that, spiromesifen (0.024%), difenthiuron (0.075%) and dicofol (0.046%) were highly effective against all stages of spider mite in brinjal and ……[6] indicated that maximum mortality of mite population was observed with propargite @ 0.17 and 0.11 per cent (49.1 and 53.37 per three leaves, respectively) and dicofol @ 0.02 per cent (56.7 per three leaves) at seven days after spraying against *T. cinnabarinus* infesting okra. Similar results were obtained by…. [3]. They revealed that *Hirsutella thompsonii* Fisher has been proposed as a possible microbial control for two spotted spider mites in greenhouses but has only been effective in the laboratory.

Number of Predatory Mite per Leaf: The data pertaining to mite population is presented in Table 2. There was no significant difference in the population of predatory mite the day before 1st spray among the treatments. Three days after spray maximum number of mites were recorded in *Verticellium leccanii, Hirsutella thomsonii,* neemark and sulphur 80 WP with 2.79, 2.62, 1.26 and 1.21 mites per leaf, respectively, while minimum number were recorded in difenthurion 50 SC (0.71/ leaf), hexythiazox 5.45 EC (0.73/ leaf), propargite 57% EC (0.74/ leaf), fenzaquin 10%EC (0.80/ leaf) and dicofol 18.5 EC (0.83/ leaf). Similar trend was noticed after seven and fifteen days of first spray in reducing the mites population among the treatments. The observation made during second chemical spray against acid lime predatory mite, maximum number of predatory mites were recorded in the treatments of *Hirsutella thomsonii, Verticellium leccanii,* neemark and sulphur with 2.76, 2.62, 1.84 and 1.26 mites per leaf, respectively. Hexythiazox 5.45 EC (0.73/ leaf), Propargite 57% EC (0.74/ leaf), spiromecifen 240 SC (0.75/ leaf), difenthurion 50 SC (0.78/ leaf), fenpyroximate 5 SC (0.79/ leaf) were recorded the least number of mites three DAS (Table 5). Seven DAS second spray, again *Hirsutella thomsonii* and *Verticellium leccanii* recorded

Table 1: Bioefficacy of synthetic acaricides and biorationals against acid lime mite after first spray.

			Number of mite/ leaf			
Tr.No.	Treatments	Dosageml or g/l	1DBS	3DAS	7DAS	15 DAS
1	Dicofol 18.5 EC	2.50 ml/l	19.46(4.52)	16.18 (4.14)^{ab}	15.27 (4.03)^{bc}	8.08 (3.01)^{c}
2	Fenpyroximate 5 SC	1.00ml/l	19.71 (4.54)	12.01 (3.60)^{bc}	3.01 (1.99)^{f}	0.82 (1.32)^{e}
3	Difenthurion 50 SC	0.80ml/l	19.98 (4.57)	12.28 (3.64)^{bc}	2.95 (1.98)^{f}	0.26 (1.11)^{e}
4	Sulphur 80 WP	2.00 g/l	20.36 (4.61)	17.66 (4.31)^{a}	14.44 (3.92)^{c}	10.94 (3.45)^{b1}
5	Abamectin 1.9 EC	0.50ml/l	18.31(3.65)	14.96 (3.65)^{bc}	7.33 (2.15)f	0.84(1.32)^{e}
6	Neem based formulation	2.00ml/l	17.99 (4.35)	17.51 (4.30)^{a}	16.60 (4.19)^{bc}	14.94 (3.99)^{a}
7	Hexythiazox 5.45 EC	1.50ml/l	18.95 (4.46)	11.86 (3.58)^{bc}	3.09 (2.02)^{f}	0.60 (1.26)^{e}
8	Spiromecifen 240 SC	0.50ml/l	19.54 (4.52)	11.38 (3.51)^{c}	2.81 (1.94) ^{f}	0.23 (1.10)^{e}
9	Propargite 57% EC	2.00ml/l	19.25 (4.49)	12.40 (3.65)^{bc}	4.47 (2.17)^{f}	0.85 (1.35)^{e}
10	Ethion 50 EC	2.00ml/l	19.44 (4.51)	16.09 (4.13)^{ab}	12.00 (3.59)^{d}	9.60 (3.25)^{bc}
11	Verticellium leccanii	1.00g/l	18.06 (4.36)	18.09 (4.36)^{a}	17.57 (4.30)^{b}	16.72 (4.20)^{a}
12	Fenzaquin 10% EC	1.00ml/l	19.63 (4.53)	13.13 (3.75)^{bc}	9.61 (3.25)^{e}	4.18 (2.25)^{d}
13	Hirsutella thomsonii	1.00g/l	19.40 (4.51)	18.09 (4.36)^{a}	15.75 (4.09)^{bc}	15.28 (4.03)^{a}
14	Untreated control		18.40 (4.40)	19.93 (4.57)^{a}	23.98 (4.99)^{a}	19.22 (4.48)^{a}
	S.Em±		0.13	0.05	0.09	0.11
	CD @ 5%		NS	0.15	0.30	0.33
	CV (%)		5.08	5.33	6.85	7.44

Table 2: Safety of synthetic acaricides and biorationals against acid lime predatory mite after first spray

			Number of mites/ leaf			
Tr.No.	Treatments	Dosageml or g/l	1DBS	3DAS	7DAS	15 DAS
1	Dicofol 18.5 EC	2.50 ml/l	0.89 (1.37)	0.83 (1.35)	1.02 (1.41)	1.14 (1.46)
2	Fenpyroximate 5SC	1.00ml/l	1.17 (1.46)	0.86 (1.36)	0.97 (1.39)	0.46 (1.20)
3	Difenthurion 50SC	0.80ml/l	0.92 (1.38)	0.71 (1.30)	0.68 (1.29)	0.40 (1.18)
4	Sulphur 80WP	2.00 g/l	1.05 (1.43)	1.21 (1.48)	1.57 (1.60)	1.37 (1.53)
5	Abamectin 1.9 EC	0.50ml/l	0.88 (1.36)	0.73 (1.30)	0.79 (1.33)	0.29 (1.13)
6	Neem based formulation	2.00ml/l	2.14 (1.76)	1.26 (1.50)	1.92 (1.70)	1.74 (1.64)
7	Hexythiazox 5.45EC	1.50ml/l	0.80 (1.33)	0.73 (1.31)	0.58 (1.25)	0.25 (1.11)
8	Spiromecifen 240SC	0.50ml/l	0.93 (1.38)	0.84 (1.35)	0.55 (1.24)	0.13 (1.00)
9	Propargite 57% EC	2.00ml/l	1.16 (1.46)	0.74 (1.31)	0.64 (1.28)	0.73 (1.03)
10	Ethion 50EC	2.00ml/l	1.20 (1.47)	0.92 (1.38)	1.49 (1.57)	1.36 (1.53)
11	Verticellium leccanii	1.00g/l	2.52 (1.83)	2.79 (1.94)	2.41 (1.82)	3.16 (2.03)
12	Fenzaquin 10%EC	1.00ml/l	0.94 (1.39)	0.80 (1.34)	0.82 (1.35)	1.03 (1.42)
13	Hirsutella thomsonii	1.00g/l	2.61 (1.87)	2.62 (1.89)	2.10 (1.75)	2.82 (1.95)
14	Untreated control		1.71 (1.62)	1.85 (1.66)	2.44 (1.84)	3.19 (2.04)
	S.Em±		0.12	0.07	0.08	0.06
	CD @ 5%		NS	0.22	0.24	0.18
	CV (%)	7.25	9.00	9.71	7.51	

DBS - Day before spraying, DAS- Day after spraying, NS- Non significant

Figures in the parentheses are √X+1 transformations

Table 3: Bioefficacy of synthetic acaricides and biorationals against acid lime mite after second spray

			Number of mites/ leaf			
Tr.No.	Treatments	Dosage	1DBS	3DAS	7DAS	15DAS
1	Dicofol 18.5 EC	2.50 ml/l	20.55 (4.64)	17.46 (4.29)^{b}	12.27 (3.64)^{de}	7.08 (2.83)^{e}
2	Fenpyroximate 5SC	1.00ml/l	19.86 (4.56)	11.68 (3.55)^{cd}	7.14 (2.85)^{g}	0.62 (1.27)^{g}
3	Difenthurion 50SC	0.80ml/l	23.19 (4.91)	10.28 (3.35)^{d}	6.57 (2.74)^{g}	0.61 (1.26)^{g}
4	Sulphur 80WP	2.00 g/l	20.49 (4.63)	16.99 (4.24)^{b}	14.77 (3.97)^{c}	12.60 (3.68)^{c}
5	Abamectin 1.9 EC	0.50ml/l	22.21 (4.81)	12.63 (3.59)^{cd}	6.92 (2.81)^{g}	0.73 (1.31)^{g}
6	Neem based formulation	2.00ml/l	20.97 (4.67)	17.51(4.30)^{b}	15.27 (4.03)^{bc}	14.52 (3.93)^{bc}
7	Hexythiazox 5.45EC	1.50ml/l	20.93 (4.68)	11.47 (3.52)^{cd}	6.61 (2.75)^{g}	0.75 (1.32)^{g}
8	Spiromecifen 240SC	0.50ml/l	22.13 (4.80)	11.38 (3.51)^{cd}	5.65 (2.57)^{g}	0.00 (1.00)^{g}
9	Propargite 57% EC	2.00ml/l	20.38 (4.61)	12.07 (3.58)^{cd}	6.47 (2.72)^{g}	0.76 (1.32)^{g}
10	Ethion 50EC	2.00ml/l	22.05 (4.79)	16.09 (4.13)^{b}	12.00 (3.59)^{e}	9.01 (3.15)^{d}
11	Verticellium leccanii	1.00g/l	21.16 (4.69)	17.09 (4.36)^{bb}	17.57 (4.30)^{b}	15.72 (4.08)^{b}
12	Fenzaquin 10%EC	1.00ml/l	19.55 (4.53)	13.08 (3.75)^{c}	9.21 (3.19)^{f}	5.40 (2.52)^{f}
13	Hirsutella thomsonii	1.00g/l	22.77 (4.86)	18.09 (4.36)^{bb}	14.42 (3.91)^{cd}	12.94 (3.73)^{c}
14	Untreated control		19.18 (4.48)	19.93 (4.57)^{b}	23.98 (4.99)^{b}	19.22 (4.48)^{b}
	S.Em±		0.16	0.08	0.10	0.09
	CD @ 5%		NS	0.23	0.29	0.27
	CV (%)		6.03	6.54	5.12	6.20

Figures in the parentheses are √X+1 transformations.

DBS- Day before spraying, DAS- Day after spraying

Table 4: Safety of synthetic acaricides and biorationals against acid lime predatory mite after second spray

			Number of mites/ leaf			
Tr.No.	Treatments	Dosage	1DBS	3DAS	7DAS	15DAS
1	Dicofol 18.5 EC	2.50 ml/l	0.93 (1.38)	0.83 (1.35)	1.16 (1.46)	1.16 (1.46)
2	Fenpyroximate 5SC	1.00ml/l	1.16 (1.46)	0.79 (1.33)	1.13 (1.44)	0.48 (1.21)
3	Difenthurion 50SC	0.80ml/l	1.20 (1.47)	0.78 (1.33)	0.71 (1.30)	0.37 (1.17)
4	Sulphur 80WP	2.00 g/l	2.52 (1.83)	1.26 (1.50)	1.57 (1.60)	1.37 (1.54)
5	Abamectin 1.9 EC	0.50ml/l	0.94 (1.39)	0.97 (1.40)	0.90 (1.37)	0.26 (1.12)
6	Neem based formulation	2.00ml/l	2.61 (1.87)	1.84 (1.66)	2.93 (1.97)	2.20 (1.77)
7	Hexythiazox 5.45EC	1.50ml/l	1.71 (1.62)	0.73 (1.31)	0.52 (1.23)	0.19 (1.09)
8	Spiromecifen 240SC	0.50ml/l	1.89 (1.68)	0.75 (1.32)	0.48 (1.21)	0.05 (1.02)
9	Propargite 57% EC	2.00ml/l	1.17 (1.46)	0.74 (1.31)	0.56 (1.24)	1.03 (1.42)
10	Ethion 50EC	2.00ml/l	2.59 (1.87)	0.80 (1.34)	1.82 (1.68)	1.67 (1.63)
11	*Verticellium leccanii*	1.00g/l	2.14 (1.76)	2.62 (1.90)	2.38 (1.81)	2.82 (1.95)
12	Fenzaquin 10%EC	1.00ml/l	0.88 (1.36)	1.63 (1.62)	0.82 (1.35)	0.15 (1.07)
13	*Hirsutella thomsonii*	1.00g/l	2.63 (1.89)	2.76 (1.93)	2.47 (1.85)	3.06 (2.01)
14	Untreated control		2.13 (1.75)	2.01 (1.72)	2.42 (1.84)	3.40 (2.09)
	S.Em±		NS	0.07	0.08	0.05
	CD @ 5%		NS	0.22	0.26	0.16
	CV (%)		NS	8.89	10.16	6.53

DBS – Day before spraying, DAS- Day after spraying, NS- Non significant

Figures in the parentheses are √X+1 transformations.

Table 5: Effect of synthetic acaricides and biorationals on the size of lime fruits

Tr. No	Treatments	Dosage (ml or g/l)	Size of fruits		
			Grade I	Grade II	Grade III
1	Dicofol 18.5 EC	2.50	61.33 (8.48)	59.66 (8.39)	79.00 (7.67)
2	Fenpyroximate 5 SC	1.00	98.00 (9.93)	64.66 (8.08)	37.33 (6.18)
3	Difenthiuron 50 SC	0.80	136.66 (11.72)	42.66 (6.60)	20.66 (4.55)
4	Sulphur 80 WP	2.00	39.66 (6.37)	75.66 (8.75)	84.66 (9.25)
5	Abamectin 1.9 EC	0.50	106.66 (10.37)	47.33 (6.84)	46.00 (6.78)
6	Neem based formulation 300ppm	2.00	42.00 (6.55)	53.00 (7.34)	105.00 (10.28)
7	Hexythiazox 5.45 EC	1.50	106.00 (9.21)	50.33 (7.87)	43.66 (6.68)
8	Spiromesifen 240 SC	0.50	136.00 (11.69)	40.00 (6.39)	24.00 (4.98)
9	Propargite 57% EC	2.00	113.66 (10.70)	48.33 (6.98)	38.00 (6.22)
10	Ethion 50 EC	2.00	49.66 (7.10)	72.66 (8.58)	77.66 (8.84)
11	Verticellium lecanii	1.00	32.66 (5.79)	46.00 (6.85)	121.33 (11.06)
12	Fenazaquin 10% EC	1.00	89.00 (9.47)	66.66 (8.22)	44.33 (6.72)
13	Hirsutella thompsonii	1.00	31.66 (5.79)	55.00 (7.37)	113.33 (10.68)
14	Untreated control		24.33 (5.00)	47.00 (6.92)	128.66 (11.38)
	S.Em±		0.51	0.35	0.60
	CD @ 5%		1.49	1.02	1.76
	CV (%)		10.53	8.20	13.10

Figures in the parentheses are √X+1 transformations.
Grade I (> 4.5 cm), Grade II (3.5-4.5 cm) Grade III (< 3.5 cm)

Table 6: Effect of synthetic acaricides and biorationals on acid lime yield and economics of acid lime cultivation.

Tr.No.	Treatments	Dosage (ml or g/l)	Yield (t/ha)	Cost of treatment (Rs/ha)	Other expenditure	Gross income (Rs/ha)	Net income	B C ratio
1	Dicofol 18.5 EC	2.50	24.50	925	90,000	3,67,500	2,76,575	1:3.04
2	Fenpyroximate 5 SC	1.00	27.10	1200	90,000	406500	3,15,300	1:3.45
3	Difenthiuron 50 SC	0.80	28.00	1072	90,000	4,20,000	3,28,928	1:3.61
4	Sulphur 80 WP	2.00	23.00	660	90,000	3,45,000	2,54,340	1:2.80
5	Abamectin 1.9 EC	0.50	27.50	800	90,000	4,12,500	3,21,700	1:3.54
6	Neem based formulation 300ppm	2.00	22.80	450	90,000	3,42,000	2,51,550	1:2.78
7	Hexythiazox 5.45 EC	1.50	27.60	895	90,000	4,14,000	3,23,105	1:3.55
8	Spiromecifen 240 SC	0.50	28.20	1140	90,000	4,23,000	3,31,860	1:3.64
9	Propargite 57% EC	2.00	25.80	745	90,000	3,87,000	2,96,255	1:3.26
10	Ethion 50 EC	2.00	24.10	1850	90,000	3,61,500	2,69,650	1:2.96
11	Verticellium lecanii	1.00	21.70	300	90,000	3,25,500	2,35,200	1:2.60
12	Fenazaquin 10% EC	1.00	25.40	670	90,000	3,81,000	2,90,330	1:3.20
13	Hirsutella thompsonii	1.00	22.60	300	90,000	3,39,000	2,48,700	1:2.75
14	Untreated control		21.50	00	90,000	3,22,500	2,32,500	1:2.58

higher number of mites, whereas spiromecifen 240 SC (0.48/ leaf), hexythiazox 5.45 EC (0.52/ leaf) and propargite 57% EC (0.56/ leaf) recorded the lowest number of mite per leaf. *Hirsutella thomsonii, Verticellium leccanii* and neemark sprayed treatment showed higher number of 3.06, 2.82 and 2.20 mites respectively and minimum were recorded in spiromecifen 240 SC (0.05/ leaf), hexythiazox 5.45 EC (0.19/ leaf).

Effect of Synthetic Acaricides and Biorationals on the Size of Lime Fruits: After chemical treatment the fruits were harvested separately. They were graded based on their size of the fruits. The maximum number of grade I fruits were recorded in difenthiuron 50 SC (136.66) and spiromesifen 240 SC (136.00) followed by propargite 57% EC (113.66), abamectin 1.9 EC (106.66), fenpyroximate 5 SC (98.00), hexythiazox 5.45 EC (90.00) and fenazaquin 10% EC (89.00). Lowest numbers of grade 1 fruits were noticed in *H. thompsonii* (31.66), *V. lecanii* (32.66), sulphur 80 WP (39.66), neemark (42.00), Ethion 50 EC (49.66) and Dicofol 18.5 EC (71.33). Maximum number of grade II of 75.66, 72.66, 69.66, 66.66, 64.66 and 55.00 fruits were recorded in sulphur 80 WP, ethion 50 EC, dicofol 18.5 EC, fenazaquin 10% EC, fenpyroximate 5 SC, *Hirsutella thompsonii*, respectively. The minimum numbers of grade II fruits were recorded in spiromesifen 240 SC (40.00), difenthiuron 50 SC (42.66), *Verticellium lecanii* (46.00), abamectin 1.9 EC (47.33), propargite 57% EC (48.33), hexythiazox 5.45 EC

(50.33) and neemark (53.00). Lowest numbers of grade III fruits were recorded in difenthiuron 50 SC and spiromesifen 240 SC of 20.66, 24.00 respectively followed by fenpyroximate 5 SC (37.33), propargite 57% EC (38.00), hexythiazox 5.45 EC (43.66), fenazaquin 10% EC (44.33) and abamectin 1.9 EC (46.00). Whereas highest numbers of grade III fruits were noticed in untreated control (128) and *V. lecanii* (121.33) followed by *H. thompsonii* (113.33), neeemark (105.00), sulphur 80 WP (84.66), dicofol 18.5 EC (79.00) and ethion 50 EC (77.66).

Effect of Acaricides on Acid Lime Yield and Economics of Acid Lime Cultivation: The results on the cost economics of citrus mite management revealed that, the highest net profit of Rs. 3,31,860 per ha/year was recorded in spiromesifen 240 SC followed by difenthiuron 50 SC, hexythiazox 5.45 EC, abamectin 1.9 EC, fenpyroximate 5 SC, propargite 57% EC, fenazaquin 10% EC, dicofol 18.5 EC and ethion 50 EC which recorded the net profit of Rs. 328928, Rs. 323105, Rs. 321700, Rs. 315300, Rs. 296255, Rs. 290330, Rs. 276575 and Rs. 2,69,650 rupees/ ha/year, respectively. Whereas *Verticellium lecanii, Hirsutella thompsonii,* neemark and Sulphur 80 WP recorded the minimum net profit of, Rs. 235200, Rs. 248700, Rs. 251550 and Rs. 254340 rupees/ ha/year, respectively. Similar result were obtained by Roopa [4] who recorded that the maximum fruit yields were recorded in spiromesifen and difenthiuron with 240.74 and 248.97 q/ha during second and 176.33 and 163.99 q/ha during third season trial, respectively.

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