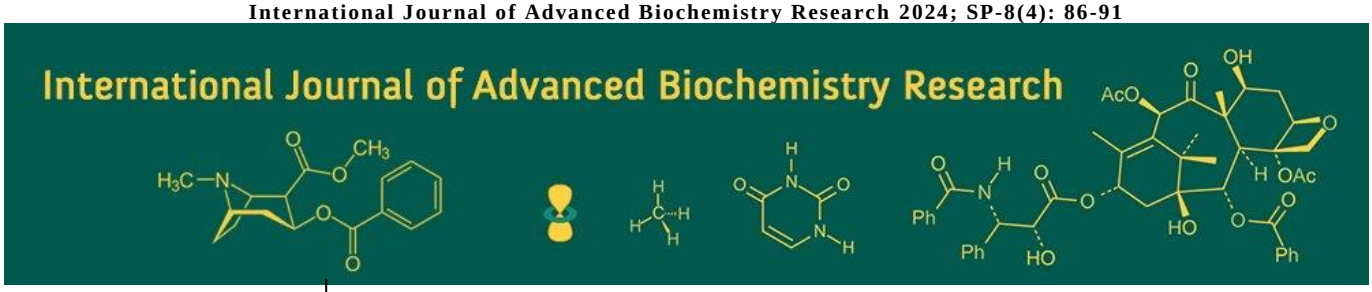

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Bio-efficacy of different Acaricides against two spotted spider mite, *Tetranychus urticae* Koch infesting okra under field condition

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Abstract
The field experiment was conducted at Entomology farm, Department of Entomology, BACA, AAU, Anand during *summer*, 2021 to determine the bio-efficacy of different acaricides against two spotted spider mite, *Tetranychus urticae* by using Randomized Block Design (RBD) with three replications and the results revealed that the lowest (3.00 mites/1 cm^2 leaf area) population of mite were found in plots treated with spiromesifen 22.9 SC @ 0.02% and it was at par with abamectin 1.9 EC @ 0.00057% (3.19 mites/1 cm^2 leaf area) and fenazaquin 10 EC @ 0.012% (3.34 mites/1 cm^2 leaf area). The highest fruit yield was recorded from the plot treated with spiromesifen 22.9 SC @ 0.02% (8574 kg/ha) and it was at par with abamectin 1.9 EC @ 0.00057% (8558 kg/ha) and fenazaquin 10 EC @ 0.012% (8541 kg/ha) as compared to the rest of treatments.

Keywords: Two spotted spider mite, *Tetranychus urticae*, field, bio-efficacy, Acaricides, Okra

Introduction
Okra, *Abelmoschus esculentus* (L.) Moench is one of the foremost widely known and utilized species of the Malvaceae and economically important vegetable crop grown in tropical and sub-tropical parts of the earth (Andras *et al*., 2005) [1]. Okra fresh leaves, buds, pods, flowers, stems and seeds have several uses so it is a multipurpose crop (Mihretu *et al*., 2014) [7]. India ranks first in the world with 6.37 million MT of okra produced from over 0.51 million ha of land and productivity of 12.49 million MT/ha (Anonymous, 2020) [2]. In Gujarat, this crop is grown in an area of about 85145 ha and production of 1.01 million MT and productivity of 11.86 million MT/ha, the okra crop occupies an area of 4415 ha with a production of 44150 MT and productivity of 10 MT/ha in Anand district (Anonymous, 2021) [3]. The okra such an important crop is infested by many insect pests right from germination to harvest (Butani and Jotwani, 1984) [4]. Major non-insect pests causing severe damage to the crop include phytophagous mite, *Tetranychus* spp. and slug (Chauhan, 2005) [5]. Among these, owing to climate changes, mite infestation in okra crop is gradually increased in middle Gujarat. In vegetable crops, the common yield losses due to mite pests in India have been estimated to be around 25 percent (Gupta, 1991) [6]. Most of the newer acaricides are preferred over the conventional ones because these compounds are reasonably promising against a wide range of mite pests with excellent activity on almost all stages of the mites at relatively lower dosages. However, their selectivity towards beneficial insects and natural enemies need to be ascertained. Judicious use of some of these acaricides with diverse mode of action will help us to manage the mite pests more effectively, simultaneously reducing the risk of resistance build up in mite pests. Considering the importance of spider mite, *T. urticae* infesting okra, the present study was undertaken to know the effectiveness of some acaricides.

Materials and Methods
Field experiment was conducted at Anand Agricultural University, Anand during *summer* season 2021 in Randomized Block Design with 10 treatments and 3 replications with a view to evaluate efficacy of different acaricides against two spotted spider mite, *T. urticae* infesting okra in field condition. Okra cultivar GAO-5 was sown by using dibbling method, with a spacing of 45 x 30 cm with gross and net area of 2.7 x 4.5 m and 1.8 x 3.9 m, respectively.

The acaricides treatments *viz.*, chlorfenapyr 10 SC, propergite 57 EC, ethion 50 EC, diafenthiuron 50 WP, spiromesifen 22.9 SC, etoxazole 10 SC, dimethoate 30 EC, abamectin 1.9 EC and fenazaquin 10 EC were applied in the form of foliar spray using knapsack sprayer. The first spray of respective acaricides was given at appearance of pest and second spray was given after 15 days of first spray. For recording observations, five plants were randomly selected from each plot and tagged. Three leaves (upper, middle and lower) were selected randomly from each plant and count the number of mites in 1 cm^2 area of selected leaf. The observations *viz*., No. of mite(s)/ 1 cm^2 leaf area and Fruit yield were recorded before as well as 1, 3,7,10 and 14 days after each spray. Data thus obtained were statistically analysed by using square root transformation and subjected to ANOVA.

Results and Discussion

With a view to evaluating the bio-efficacy of various acaricides against the two spotted spider mites, *T. urticae* infesting okra. A field experiment was conducted in the *summer*, 2021-22 at Entomology farm, AAU, Anand. The effectiveness of acaricides based on the incidence of pest and yield data. The periodical data on population of two spotted spider mite, *T. urticae* in different treatments were recorded during *summer*, 2021-22. Each treatment was consisting of two sprays applied at an interval of 15 days by initiating the first spray after appearance of the pest incidence. The data obtained on two spotted spider mite population and yield is statistically analyzed and results are discussed as follow.

Bio-efficacy based on two spotted mite population

The periodical, as well as the data on pooled over periods and sprays on two spotted spider mite population recorded during summer, 2021-22, are presented in Table 1, 2 and 3, respectively, whereas graphically depicted in Fig. 1. The population of two spotted spider mite (nymph and adult) per 3 leaves was homogeneous before spray in all the treatments as treatment difference was non-significant during each spray. All the evaluated acaricides were significantly superior to the control up to 14 days of spray as well as pooled analysis.

First spray

The lowest population of two spotted spider mite, *T. urticae* was recorded in okra plots treated with spiromesifen 22.9 EC 0.02% (6.98 mites/1 cm^2 leaf area) and it was at par with abamectin 1.9 EC 0.00057% (7.20 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (7.33 mites/1 cm^2 leaf area) after first day of spray (Table 1). These three treatments were found significantly superior to rest of the treatments. Whereas, the treatment of propergite 57 EC 0.14% (10.66 mites/1 cm^2 leaf area), ethion 50 EC 0.05% (10.99 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (11.47 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (11.71 mites/1 cm^2 leaf area) were emerged out as next best treatments and found at par with eachothers. Similarly, the highest (14.48 mites/1 cm^2 leaf area) mite population was recorded in chorfenapyr 10 SC 0.015% and it was at par with treatment of dimethoate 30 EC 0.03% (14.64 mites/1 cm^2 leaf area) and were least effective.

Table 1: Bio-efficacy of acaricides against two spotted spider mite, *T. urticae* infesting okra during first spray

Tr. No.	Treatments	Conc. (%)	Before Spray	No. of mites/ 1 cm^2 leaf area at indicated days after spray					
				1	3	7	10	14	Pooled
T_1	Chlorfenapyr 10 SC	0.015	3.92 (14.87)	3.87abc (14.48)	3.55ab (12.10)	3.18b (9.61)	3.30b (10.40)	3.63ab (12.66)	3.51b (11.82)
T_2	Propergite 57 EC	0.14	3.91 (14.79)	3.34def (10.66)	2.94cd (8.11)	2.59c (6.20)	2.69cd (6.71)	2.93c (8.06)	2.89c (7.85)
T_3	Ethion 50 EC	0.05	3.92 (14.87)	3.39cde (10.99)	2.97cd (8.33)	2.62c (6.37)	2.71c (6.85)	2.94c (8.16)	2.93c (8.03)
T_4	DiafenthIuron 50 WP	0.06	3.88 (14.55)	3.46bcd (11.47)	2.99c (8.48)	2.67c (6.62)	2.77c (7.17)	3.05c (8.78)	2.99c (8.44)
T_5	Spiromesifen 22.9 SC	0.02	3.75 (13.56)	2.74f (6.98)	2.36e (5.07)	1.97d (3.37)	2.09e (3.90)	2.33d (4.93)	2.29d (4.74)
T_6	Etoxazole 10 SC	0.008	3.90 (14.71)	3.49bcd (11.71)	3.04bc (8.75)	2.71bc (6.84)	2.83bc (7.50)	3.09bc (9.05)	3.03c (8.74)
T_7	Dimethoate 30 EC	0.03	3.90 (14.71)	3.89ab (14.64)	3.59a (12.42)	3.22b (9.84)	3.34b (10.63)	3.69a (13.10)	3.55b (12.10)
T_8	Abamectin 1.9 EC	0.00057	3.70 (13.19)	2.77ef (7.20)	2.39e (5.25)	2.01d (3.54)	2.17e (4.21)	2.35d (5.01)	2.34d (4.98)
T_9	Fenazaquin 10 EC	0.012	3.78 (13.79)	2.79def (7.33)	2.45de (5.50)	2.07d (3.78)	2.21de (4.38)	2.37d (5.09)	2.38d (5.16)
T_{10}	Control	-	3.93 (14.94)	3.93a (14.99)	3.97a (15.24)	3.99a (15.44)	4.03a (15.77)	4.05a (15.87)	4.00a (15.42)
S. Em. ± Treatment (T)			0.18	0.18	0.16	0.15	0.15	0.16	0.07
Period (P)			-	-	-	-	-		0.05
T x P			-	-	-	-	-		0.16
F Test (T)			NS	Sig	Sig.	Sig.	Sig.	Sig.	Sig.
C.V. (%)			8.59	9.02	9.15	9.80	9.18	9.07	9.09

Note

1. Figures in parentheses are retransformed values and those outside are $\sqrt{x}$ + 0.5 transformed values
2. Treatment mean(s) with a letter(s) in common is not significant by Duncan's New Multiple Range Test (DNMRT) at 5% level of significance
3. Significant parameters and their interaction: T x P

Third day after spray, the minimum mite population was observed in the okra plots treated with spiromesifen 22.9 SC 0.02% (5.07 mites/1 cm^2 leaf area), abamectin 1.9 EC 0.00057% (5.25 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (5.50 mites/1 cm^2 leaf area). While, treatment of propergite 57 EC 0.14% (8.11 mites/1 cm^2 leaf area), ethion 50 EC 0.05% (8.33 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (8.48 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.08% (8.75 mites/1 cm^2 leaf area) were at par with each other and found moderately effective in their efficacy. Of the evaluated acaricides, highest mite population was noticed from the plot treated with chlorfenapyr 10 SC 0.015% (12.10 mites/1 cm^2 leaf area), dimethoate 30 EC 0.03% (12.42 mites/1 cm^2 leaf area) and were inferior in their efficacy.

More or less similar trend of efficacy was observed at seven days after first spray. In which, plots treated with spiromesifen 22.9 SC 0.02% (3.37 mites/1 cm^2 leaf area), abamectin 1.9 EC 0.00057% (3.54 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (3.78 mites/1 cm^2 leaf area) were recorded lowest mite population. While, plots treated with chlorfenapyr 10 SC 0.015% (9.61 mites/1 cm^2 leaf area) and dimethoate 30 EC 0.03% (9.84 mites/1 cm^2 leaf area) noticed highest mite population.

After ten days of spray, the treatment of spiromesifen 22.9 SC 0.02% (3.90 mites/1 cm^2 leaf area) had continued its superiority over rest of the evaluated acaricides. Even so, it was remained at par with the treatments of abamectin 1.9 EC 0.00057% (4.21 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (4.38 mites/1 cm^2 leaf area).The treatment of propergite 57 EC 0.14% (6.71 mites/1 cm^2 leaf area), ethion 50 EC 0.05% (6.85 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (7.17 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (7.50 mites/1 cm^2 leaf area) were stood as next best treatment.Whereas, the highest mite population was recorded in treatments of chlorfenapyr 10 SC 0.015% (10.40 mites/1 cm^2 leaf area) and dimethoate 30 EC 0.03% (10.63 mites/1 cm^2 leaf area).

Similarly, after fourteen days of spray, the treatment of spiromesifen 22.9 SC 0.02% (4.93 mites/1 cm^2 leaf area) had continued its superiority over rest of the evaluated acaricides. Even so, it was remained at par with the treatments of abamectin 1.9 EC 0.00057% (5.01 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (5.09 mites/1 cm^2 leaf area). The treatment of propergite 57 EC 0.14% (8.06 mites/1 cm^2 leaf area), ethion 50 EC 0.05% (8.16 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (8.78 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (9.05 mites/1 cm^2 leaf area) were stood as next best treatment. Whereas, highest mite population was recorded in treatments of chlorfenapyr 10 SC 0.015% (12.66 mites/1 cm^2 leaf area) and dimethoate 30 EC 0.03% (13.10 mites/1 cm^2 leaf area).

Second spray

The data of first days after second spray revealed that spiromesifen 22.9 SC 0.02% (3.46 mites/1 cm^2 leaf area), abamectin 1.9 EC 0.00057% (3.91 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (4.17 mites/1 cm^2 leaf area) were effective in reducing the mite population (Table 2). Whereas, plots treated with chlorfenapyr 10 SC 0.015% (11.89 mites/1 cm^2 leaf area) recorded highest mite population which was at par with and dimethoate 30 EC 0.03% (12.24 mites/1 cm^2 leaf area).

At three days after second spray, spiromesifen 22.9 SC 0.02% (2.96 mites/1 cm^2 leaf area) had continued its superiority by reducing minimum mite population and remain at par with abamectin 1.9 EC 0.00057% (3.19 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (3.42 mites/1 cm^2 leaf area). Comparatively more or less similar results of rest of the acaricides were also observed.

Significantly lowest mite population was noticed from plots treated with spiromesifen 22.9 SC 0.02% (1.43 mites/1 cm^2 leaf area) which was at par with abamectin 1.9 EC 0.00057% (1.63 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (1.84 mites/1 cm^2 leaf area) after seven days of second spray. The plots treated with propergite 57 EC 0.014% (3.66 mites/1 cm^2 leaf area) recorded significantly lower mite population and stood at par with ethion 50 EC 0.05% (3.95 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (4.30 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (4.61 mites/1 cm^2 leaf area). Of the evaluated acaricides, maximum mite population was observed from plots treated with chlorfenapyr 10 SC 0.015% (7.01 mites/1 cm^2 leaf area). However, it was at par with dimethoate 30 EC 0.03% (7.68 mites/1 cm^2 leaf area).

Table 2: Bio-efficacy of acaricides against two spotted spider mite, *T. urticae* infesting okra during second spray

Tr. No.	Treatments	Conc. (%)	No. of mites/ 1 cm^2 leaf area at indicated days after spray					
			1	3	7	10	14	Pooled
T_1	Chlorfenapyr 10 SC	0.015	3.52ab (11.89)	3.32b (10.52)	2.74bc (7.01)	1.97b (3.38)	1.83bc (2.85)	2.67b (6.68)
T_2	Propergite 57 EC	0.14	2.74c (7.01)	2.55c (6.00)	2.04d (3.66)	1.46d (1.63)	1.40d (1.46)	2.04d (3.66)
T_3	Ethion 50 EC	0.05	2.83c (7.51)	2.62c (6.36)	2.11d (3.95)	1.58cd (2.00)	1.47d (1.66)	2.12cd (3.99)
T_4	DiafenthIuron 50 WP	0.06	2.91c (7.97)	2.68c (6.68)	2.19d (4.30)	1.63cd (2.19)	1.53cd (1.84)	2.19cd (4.30)
T_5	Spiromesifen 22.9 SC	0.02	1.99d (3.46)	1.86d (2.96)	1.39e (1.43)	0.99e (0.48)	0.94e (0.38)	1.43e (1.54)
T_6	Etoxazole 10 SC	0.008	2.96bc (8.26)	2.73c (6.95)	2.26cd (4.61)	1.81bc (2.78)	1.61bcd (2.09)	2.27c (4.65)
T_7	Dimethoate 30 EC	0.03	3.57ab (12.24)	3.42b (11.20)	2.86b (7.68)	2.04b (3.66)	1.88b (3.03)	2.75b (7.06)
T_8	Abamectin 1.9 EC	0.00057	2.10d (3.91)	1.92d (3.19)	1.46e (1.63)	1.01e (0.52)	0.98e (0.46)	1.49e (1.72)
T_9	Fenazaquin 10 EC	0.012	2.16d (4.17)	1.98d (3.42)	1.53e (1.84)	1.04e (0.58)	1.02e (0.56)	1.55e (1.90)

T_{10}	Control		4.06a (15.98)	4.08a (16.15)	4.10a (16.39)	3.19a (9.68)	3.18a (9.61)	3.72a (13.34)
S. Em. ± Treatment (T)			0.18	0.17	0.14	0.09	0.09	0.06
Period (P)			-	-	-	-	-	0.04
T x P			-	-	-	-	-	0.14
F Test (T)			Sig	Sig.	Sig.	Sig.	Sig.	Sig.

Note
1. Figures in parentheses are retransformed values and those outside are $\sqrt{x}$ + 0.5 transformed values
2. Treatment mean(s) with letter(s) in common are not significant by Duncan's New Multiple Range Test (DNMRT) at 5% level of significance
3. Significant parameters and its interaction: T x P

The treatment of spiromesifen 22.9 SC 0.02%, abamectin 1.9 EC 0.00057% and fenazaquin 10 EC 0.012% were observed most effective against two spotted spider mite infesting okra at ten days after second spray by recording the incidence of 0.48, 0.52 and 0.58 mites per 1 cm^2, respectively and remain at par. The treatment of propergite 57 EC 0.014% (1.63 mites/1 cm^2 leaf area), ethion 50 EC 0.05% (2.00 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (2.19 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (2.78 mites/1 cm^2 leaf area) where stood as a next best treatment. Whereas, highest mite population was recorded in treatments of chlorfenapyr 10 SC 0.015% (3.38 mites/1 cm^2 leaf area) and dimethoate 30 EC 0.03% (3.66 mites/1 cm^2 leaf area).

The treatment of spiromesifen 22.9 SC 0.02%, abamectin 1.9 EC 0.00057% and fenazaquin 10 EC 0.012% were observed most effective against two spotted spider mite infesting okra at fourteen days after second spray by recording the incidence of 0.38, 0.46 and 0.56 mites per 1 cm^2, respectively and remained at par. The treatment of propergite 57 EC 0.014% (1.46 mites/1 cm^2 leaf area), ethion 50 EC 0.05% (1.66 mites/1 cm^2 leaf area), diafenthiuron 50 WP 0.06% (1.84 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (2.09 mites/1 cm^2 leaf area) where stood as a next best treatment, however, highest mite population was recorded in treatments of chlorfenapyr 10 SC 0.015% (2.85 mites/1 cm^2 leaf area) and dimethoate 30 EC 0.03% (3.03 mites/1 cm^2 leaf area).

Pooled over periods and sprays

The data on pooled over periods and sprays (Table 3) clearly indicated that the treatment of spiromesifen 22.9 SC 0.02% (3.00 mites/1 cm^2 leaf area), abamectin1.9 EC 0.00057% (3.19 mites/1 cm^2 leaf area) and fenazaquin 10 EC 0.012% (3.34 mites/1 cm^2 leaf area) were found significantly superior to all the evaluated acaricides. Also, propergite 57 EC 0.014% (5.60 mites/1 cm^2 leaf area) ethion 50 EC 0.05% (5.90 mites/1 cm^2 leaf area), diafenthuron 50 WP 0.06% (6.21 mites/1 cm^2 leaf area) and etoxazole 10 SC 0.008% (6.52 mites/1 cm^2 leaf area) treated okra plots revealed significantly lower incidence of two spotted spider mite compared to the remaining acaricides. Whereas, theplot was treated with chlorfenapyr 10 SC 0.015% (9.05 mites/1 cm^2 leaf area) which was at par with dimethoate 30 EC 0.03% (9.42 mites/1 cm^2 leaf area) and were inferior in reducing the mite population.

The above findings were more or less similar to those of Rai *et al*. (2010) [10] who reported maximum mortality with abamectin, propergite and ethion, *i. e*., 87.44, 81.66 and 72.94 percent, respectively. Similarly, Shah and Shukla (2014) [11], Patil *et al*. (2014) [9], Siddhapara and Virani (2016) [12] and Patel & Patel (2017) [8] confirmed the present findings who reported that diafenthuron 50 WP, dimethoate 0.03%, chlorfenapyr 0.02%, fenazaquin 0.01% and spiromesifen 0.02% was most effective against *T. urticae*.

Table 3: Bio-efficacy of acaricides against two spotted spider mite, *T. urticae* infesting okra (Pooled over periods and sprays)

Tr. No.	Treatments	No. of mites/ 1 cm^2 leaf area after indicated spray		
		First	Second	Pooled over periods and sprays
T_1	Chlorfenapyr10 SC	3.51b (11.82)	2.67b (6.68)	3.09b (9.05)
T_2	Propergite 57 EC	2.89c (7.85)	2.04d (3.66)	2.47d (5.60)
T_3	Ethion 50 EC	2.93c (8.03)	2.12cd (3.99)	2.53cd (5.90)
T_4	Diafenthiuron 50 WP	2.99c (8.44)	2.19cd (4.30)	2.59cd (6.21)
T_5	Spiromesifen 22.9 SC	2.29d (4.74)	1.43e (1.54)	1.87e (3.00)
T_6	Etoxazole 10 SC	3.03c (8.74)	2.27c (4.65)	2.65c (6.52)
T_7	Dimethoate 30 EC	3.55b (12.10)	2.75b (7.06)	3.15b (9.42)
T_8	Abamectin 1.9 EC	2.34d (4.98)	1.49e (1.72)	1.92e (3.19)
T_9	Fenazaquin 10 EC	2.38d (5.16)	1.55e (1.90)	1.96e (3.34)
T_{10}	Control	4.00a (15.42)	3.72a (13.34)	3.86a (14.40)
S. Em. ± Treatment (T)		0.07	0.06	0.05
Period (P)		0.05	0.04	0.03
Spray (S)		-	-	0.02
T x P		0.16	0.14	0.10
T x S		-	-	0.07
P x S		-	-	0.05
T x P x S		-	-	0.15
F Test (T)		Sig.	Sig.	Sig.
C.V. (%)		9.09	10.64	9.74

Note
1. Figures in parentheses are retransformed values and those outside are $\sqrt{x}$ + 0.5transformedvalues
2. Treatment mean(s) with letter(s) in common are not significant by Duncan's New Multiple Range Test (DNMRT) at 5% level of significance
3. Significant parameters and its interaction: P, S, P x S and T x S

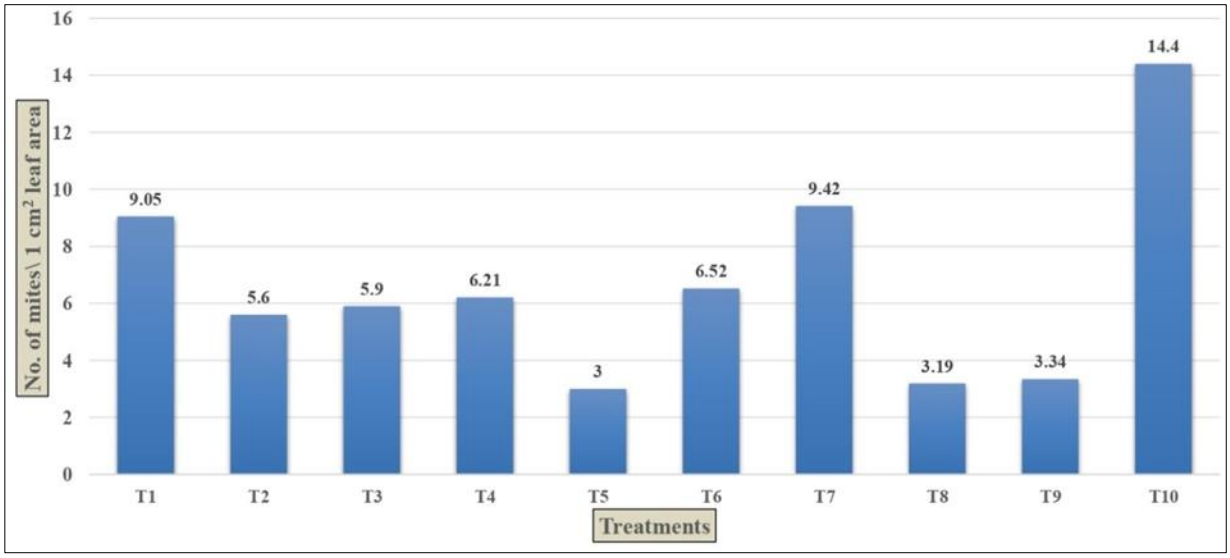

Fig 1: Bio-efficacy of acaricides against two spotted spider mite, *Tetranychus urticae* infesting okra

Impact on yield

The data on fruit yield of okra crop were recorded from the various acaricides treatment during *summer*, 2021-22 are presented in Table 4.

Table 4: Impact of various acaricides on yield of okra

Tr. No.	Treatments	Fruit yield (kg/ha)
T_1	Chlorfenapyr 10 SC	6959d
T_2	Propergite 57 EC	7995b
T_3	Ethion 50 EC	7978bc
T_4	Diafenthuron 50 WP	7960bc
T_5	Spiromesifen 22.9 SC	8574a
T_6	Etoxazole 10 SC	7951c
T_7	Dimethoate 30 EC	6941d
T_8	Abamectin 1.9 EC	8558a
T_9	Fenazaquin 10 EC	8541a
T_{10}	Control	5451e
S.Em. ±		401
Ftest (T)		Sig.
C.V.(%)		9.02

Note: Treatment mean(s) with letter(s) in common are not significant by Duncan's New Multiple Range Test (DNMRT) at 5% level of significance.

Fruit yield

Tender fruits of okra were harvested at an interval of two to three days. Okra fruits from each net plot were harvested separately and weighed. Total 17 pickings were made. Total yield from each net plot area was converted from kg/plot to kg/ha. The effectiveness of various acaricides against two spotted spider mites was also reflected in yield.

Significantly highest yield was obtained from the plots treated with spiromesifen 22.9 SC 0.02% (8574 kg/ha) and it was at par with abamectin 1.9 EC 0.00057% (8558 kg/ha) and fenazaquin 10 EC 0.012% (8541 kg/ha). Whereas, in treatments of propergite 57 EC 0.014% (7995 kg/ha), ethion 50 EC 0.05% (7978 kg/ha), diafenthiuron 50 WP 0.06% (7960 kg/ha) and etoxazole 10 SC 0.008% (7951 kg/ha) were found at par with eachother and recorded more or less similar yield. Rest of the treatments *viz.*, chlorfenapyr 10 SC 0.015% (6959 kg/ha) and dimethoate 30 EC 0.03% (6941 kg/ha) were at par with each other and produced lowest yield than other treatments.

In conclusion, the present study showed that the acaricides, *viz.*, spiromesifen 22.9 SC 0.02%, abamectin 1.9 EC 0.00057% and fenazaquin 10 EC 0.012% were found most effective and recorded minimum mite population with highest fruit yield compared to other treatments. The highest fruit yield was obtained from the plots treated with spiromesifen 22.9 SC 0.02% which is at par with abamectin 1.9 EC 0.00057% and fenazaquin 10 EC 0.012% and lowest yield obtained from chlorfenapyr 10 SC 0.015% which is at par with dimethoate 30 EC 0.03%.

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